JUNE 7, 1954

NEWS ISSUE

Electrical World

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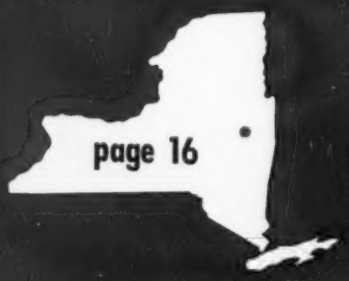
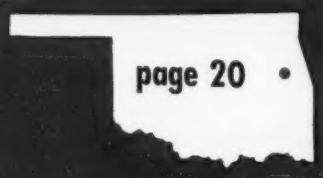
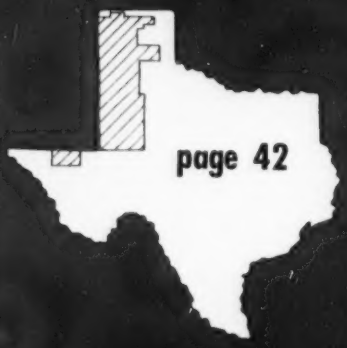


GE exhibits all-electric home at Schenectady



Remote controls run Tenkiller Plant in Oklahoma

Vepco's power dam is rising at Roanoke Rapids



Southwestern PS is doubling load in Texas

E & POWER
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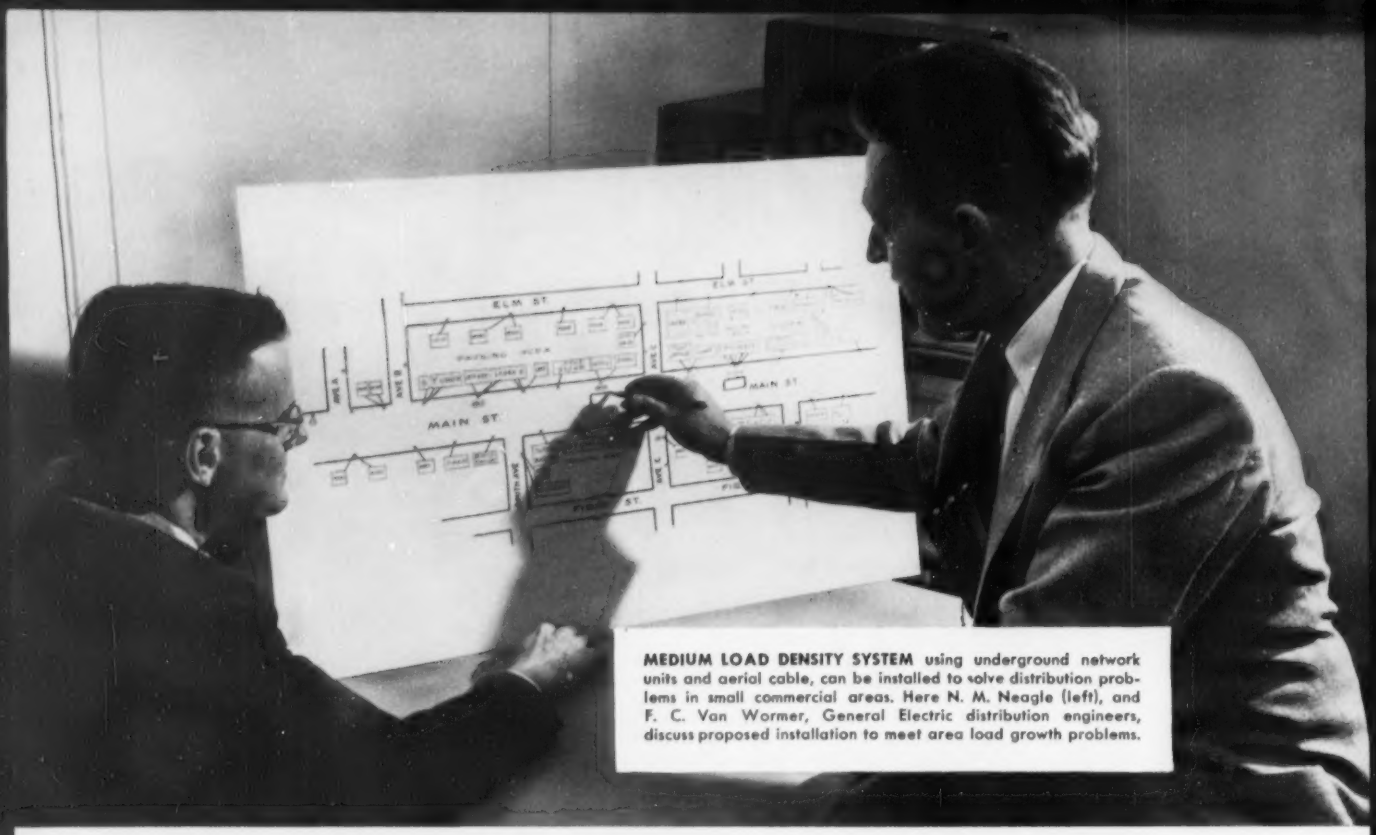
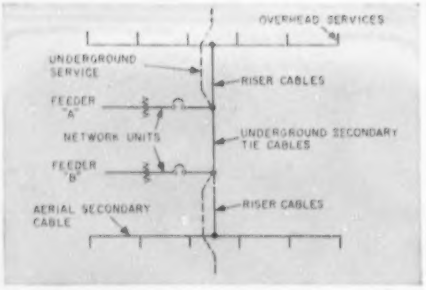
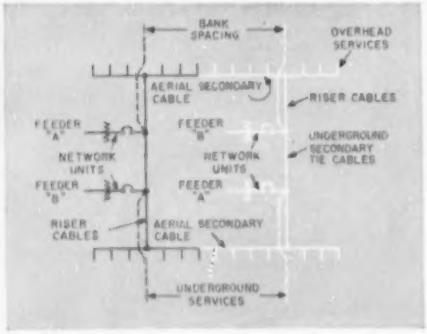


MEDIUM LOAD DENSITY SYSTEM using underground network units and aerial cable, can be installed to solve distribution problems in small commercial areas. Here N. M. Neagle (left), and F. C. Van Wormer, General Electric distribution engineers, discuss proposed installation to meet area load growth problems.

Semi-underground network licks bottlenecks, provides for expansion in commercial areas



NETWORK STARTED with a minimum of two primary feeders and vault equipment.



NETWORK EXPANDED showing two-feeder, four-unit network with complete utilization of all equipment previously used.

Medium load density relieves "Main Street" congestion where loads of 50-100 kva per 100′ of street are anticipated

More and more utility companies are finding that the practical solution to distribution problems in commercial areas of growing towns and small cities is the semi-underground network. This system combines transformers in underground vaults with aerial cable secondaries.

COMPONENTS RE-USABLE LATER

In a new look at the distribution problems of medium density areas, General Electric has given careful consideration to the economics involved. With a system for such an area providing 120/208 volts, the vault and underground equipment are entirely reusable should the need for a full underground network develop in the future. Starting a network of this type while the load is still of medium density simplifies meeting future load growth, and provides customers with the advantages of network dependability as soon as possible.

If the load along the main street of the commercial area is expected to be within the range of 50 to 100 kva per 100 feet of street within the next ten to fifteen years, this type network should be seriously considered.

CONGESTION ELIMINATED

The use of a few, large, vault-located transformers in the semi-underground network eliminates all transformers mounted on poles. Preassembled aerial cable secondaries replace separate open-wire lighting and power circuits, giving improved voltage regulation.

This new and fully correlated approach by General Electric to the problems of medium density areas makes possible better co-ordination of transformers, protectors, aerial cables, risers, and underground ties.

For more information about this economical method of solving distribution problems, write for "Medium Load Density Secondary Networks" to General Electric Company, Section 301-258, Schenectady 5, N. Y.

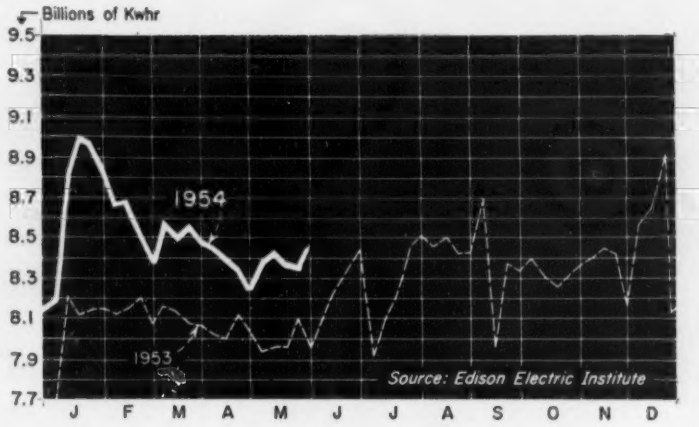
MORE POWER TO AMERICA

GENERAL ELECTRIC

VOLUME 141, NO. 23

June 7, 1954

Electrical World



Output Week Ended May 29—8,433,000,000 Kwhr

Seasonally Adjusted Index†—169.0

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
May 29	+6.0	+5.4	+1.6	+0.5	+7.9	+15.7	−4.8	+13.1	+8.7	+12.7
May 22	+4.5	+3.5	−0.9	−4.2	+8.1	+16.4	+7.9	+6.2	+5.4	+8.3
May 15	+5.3	+2.4	−0.4	−3.2	+7.7	+19.8	+7.9	+6.4	+7.3	+5.7

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load‡ (Million Kw)	Mar.	74.7	74.9	70.7
Capacity (Million Kw)	Feb.	92.46	91.68	82.83
Production (Billion Kwhr)	Mar.	38.92	35.21	36.97
Hydro	Mar.	9.92	8.56	10.20
Fuel	Mar.	29.00	26.65	26.77
Fuel Consumption				
Coal (Million Tons)	Mar.	9.89	9.07	9.44
Oil (Million Barrels)	Mar.	6.46	5.70	8.08
Gas (Billion Cu Ft)	Mar.	78.23	75.74	70.16
Sales (Billion Kwhr)	Mar.	32.53	32.37	31.73
Residential	Mar.	10.15	10.50	9.10
Commercial	Mar.	5.60	5.60	5.18
Industrial	Mar.	14.67	14.21	15.36
Other	Mar.	2.10	2.05	2.09
Net Income Class A & B Companies ($ Million)	Mar.	94.29	111.85	91.64
Estimated Dec. 54 Peak‡ (Million Kw)	Mar.	88.5	88.8	92.1
Kwhr per Residential Customer (12 Month Average)	Feb.	2,382	2,363	2,198
Revenue per Kwhr Residential Service (12 Month Average)	Feb.	2.73¢	2.74¢	2.76¢
Canadian Production (Billion Kwhr)	Mar.	5.77	5.15	5.78

Business Statistics

FRB Industrial Production Index†	Apr.	123	125	136
Gross National Production Annual Rate ($ Billion)	1st Qtr	358.5	363.5	363.9
EW 4 Industry Production Index†	Apr.	115.1	116.7	126.5
ENR Construction Cost Index††	Apr.	129.0	128.7	123.6
BLS Consumer's Price Index	Apr.	114.6	114.8	113.7
NEMA Insulation Materials Sales Index†	Mar.	136	120	190
NEMA Electric Appliance Sales Index†	Mar.	105	98	140
NEMA Household Refrig. Sales Index†	Mar.	89	91	108

*Preliminary **Revised ‡Class I Systems †1947-49=100 ††1949=100

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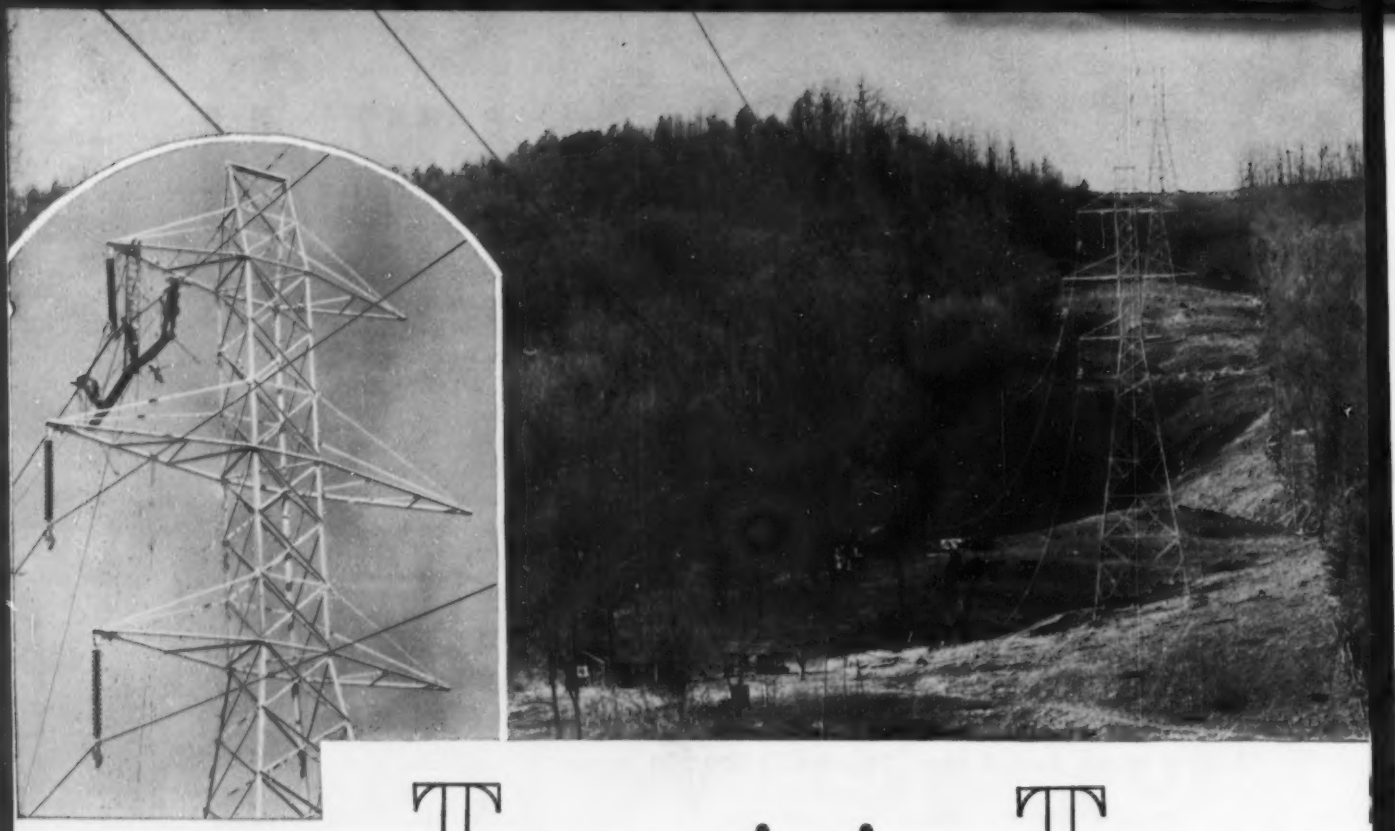

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THE ELECTRICAL WEEK

The Issue's News Highlights . . . American Gas & Electric is winner of the Charles A. Coffin Medal.

New draft of nuclear power bill to encourage industrial development of atomic energy is being considered by Joint Congressional Atomic Energy Committee.

President Eisenhower upgrades Federal Interagency River Basin Committee to coordinate government water resources policy.

Legislation authorizing $320-million John Day "partnership" project is introduced in Congress.

EEI Convention Highlights . . . More than 3,000 representatives of the electric utility industry gathered at Atlantic City last week for EEI's annual convention. Here are the highpoints of a few of the speeches:

Walter Sammis, president of EEI and Ohio Edison: "There is no need for the federal government to appropriate money now, or at any other time, to assure an adequate power supply for this country." . . . "When all the facts are thoroughly understood by our citizens they will come to but one conclusion on the basis of 75 years of experience; namely, that the federal government should not engage in the generation, transmission, and distribution of electricity in competition with the investor-owned electric utility companies."

Stuart Campbell, partner Booz, Allen & Hamilton: "Despite the present leveling off, your industry forecasts for the next ten years are still sound indicators that you have great potential."

Walker Cisler, president, Detroit Edison: "By the year 1965, demands for electric power will be double those of today, and by 1975 it is reasonable to expect a three or even four-fold increase in the use of electricity by the homes, farms, stores, and factories of our nation."

Henry B. Sargent, president, Arizona PS: "Customer relations are the reflection of what our customers feel and believe so customer relations will determine our success or failure." Requirements for a sound customer relations philosophy include "willingness to finance new facilities, encouragement of sound regulation, support of a sound money program, elimination of unfair discrimination, and contribution to expanded research."

No. 2 post at BPA, that of assistant administrator, will be manned by Byron L. Price, formerly chief administrative aide to the superintendent of the Eugene, Ore., Water and Electric Board. In another change, Orren Brownson was moved up from director of the division of general services to the post of assistant to the administrator.

Off the Washington Wire . . . AEC selected Stone & Webster to perform architect-engineering service associated with design of nuclear portion of PWR project to be built near Shippingport, Pa. Stone & Webster will work on design and preparation of plans and specifications for reactor foundations, reactor containing structure, and fuel handling facilities of the plant. The company will be reimbursed by the government for actual costs and will receive $1 for services rendered.

Invitations for bids will be sent out by AEC about July 15 for design and fabrication of a 1,000-kw "package" atomic power plant. Contract will be handled through AEC's Chicago Operations Office.

Hoover Commission task force on water resources and power will hold a public hearing in New York City June 14 at U. S. Court House, Foley Sq., at 10 a.m.

Interior, through Bureau of Reclamation's Sacramento regional office, has extended until June 1, 1955, an offer to sell 33,000 kw of California CVP power for use in Nevada. Nevada users still must find a way to wheel the power to their state.

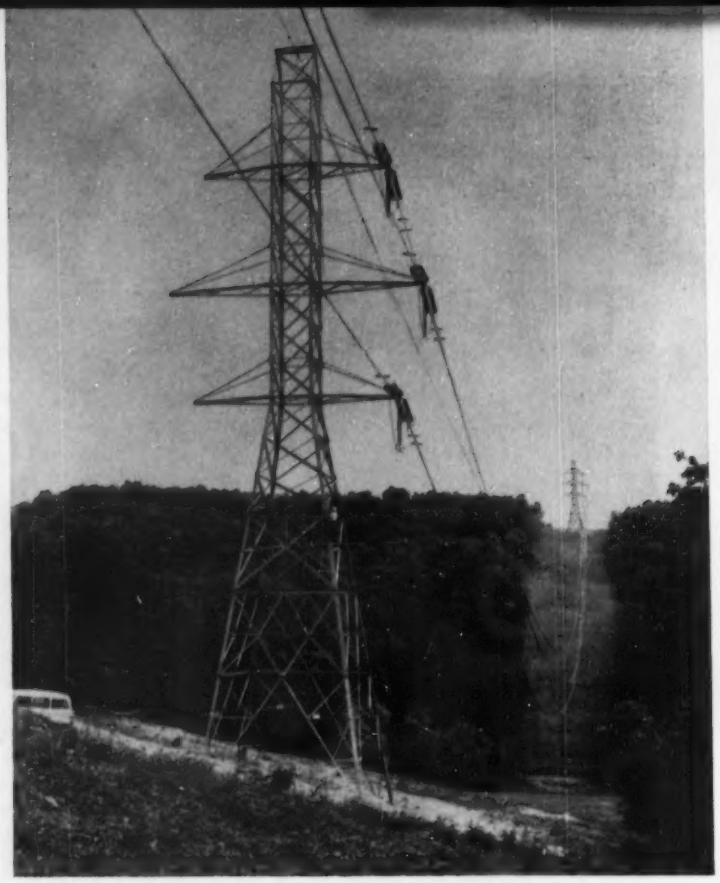
Arkansas P&L is asking for an overall 12% increase in electric rates to boost revenue by $3.9 million.

Brown Boveri, low bidder last year on turbo-generator set for City of Detroit whose bid along with all other manufacturers' was rejected, announced it would not tender an offer on the new request for bids for the same equipment because of what it contends are highly discriminatory clauses in the specifications which were so written as to apply solely to Brown Boveri. In making the announcement the firm said its bid last year more than met the city's technical specifications and in addition complied with provisions of the "Buy American" Act.

PIP elected the following to its Steering Committee for three-year terms: Robert Ginna, executive vice president, Rochester G&E, re-elected chairman; and H. B. Sargent, president, Arizona Public Service, vice chairman. Ginna, Sargent, L. V. Sutton, president, Carolina P&L, and Bayard L. England, president, Atlantic City Electric, were made members of PIP's newly created Executive Committee.

Executive Changes . . . Harold Turner, vice president and general manager of Ohio Power, was named executive vice president of American Gas & Electric Service Corp. A. N. Prentice, Ohio Power's assistant general manager, replaces Turner . . . Jack K. Busby, general counsel of Pennsylvania P&L, was appointed vice president and general counsel . . . Wisconsin Public Service elected these vice presidents: C. B. Boulet, personnel; A. G. Bur, sales; and G. S. Meyrick, power production and engineering.

For building nation's first 330-kv line and developing super-critical pressure generating unit . . . →



American G&E Earns a Coffin Award

Winner of the Charles A. Coffin Medal for outstanding achievements during 1953 is American Gas & Electric Co.

The electric industry's highest honor was accorded AG&E for pioneering these two important engineering advances:

- Initial operation of the nation's first 330-kv transmission line.
- Initiation of the manufacture and installation of the nation's first electric power generating unit to utilize ultra-high-pressure steam.

The award was presented to Philip Sporn, AG&E president, by Philip D. Reed, chairman of General Electric, in ceremonies conducted at Edison Electric Institute annual convention held last week in Atlantic City, N. J.

Established 31 years ago to honor General Electric's first president, the award consists of a gold medal and $1,000 for the winning company's employee benefit fund.

Super-High Voltage Line . . . First section of AG&E system's 330-kv transmission network was placed in operation in Ohio and West Virginia by Ohio Power Co and Appalachian Electric Power Co. It will serve as the backbone of the system's bulk power delivery when linked with other sections of the line now under construction.

Before construction on the 330-kv network began, five years of extensive and intensive research into the problems and economics of super-high-voltage transmission were conducted. AG&E, in cooperation with several electrical equipment manufacturers, constructed a full-scale "outdoor transmission laboratory" at Brilliant, Ohio, where tests were conducted at levels as high as 500 kv.

Ultra-High-Pressure Steam Unit . . . The new, super-critical pressure generating unit is a developmental machine on which AG&E began engineering and design work last year. It will be installed in the Philo Plant of Ohio Power and will have a capacity of 120,000 kw.

The unit will operate at a steam pressure of 4,500 psi—far above the critical pressure of 3,206 psi, at which point water flashes instantaneously into steam without an intermediate "boiling" stage.

Other unprecedented features of the Philo unit are its utilization of steam at a temperature of 1,150F and the double reheat of the steam, both of which are still further steps toward increased efficiency and economy.

In pioneering the 330-kv line and the Philo generating unit, AG&E was cited for "notably demonstrating the continuing ability of the electric utilities to expand service benefits to the American people through technological advances.

AG&E was selected as recipient of the Coffin Award after a nominating panel had reviewed the accomplishments of operating electric companies in 1953. Committee of judges picked the winner from among five nominees.

Nuclear Power Bill Redrafted

Joint Congressional Atomic Energy Committee revises measure which would amend present Atomic Energy Act

A spanking new draft of legislation to foster industrial development of nuclear power was before the Joint Congressional Atomic Energy Committee as hearings continued last week.

Government witnesses headed by Atomic Energy Commission officials were prepared to give their views on the proposed new law, which would become the legal guide for handling all atomic energy matters.

The latest version of the legislation replaces an earlier draft written by the Joint Committee in late April (EW, April 26, p 6). Hearings on the earlier draft were conducted in May (EW, May 17, p 122; May 24, pp 6, 7). The new draft attempts to meet criticisms leveled at the earlier draft by electric utility and other spokesmen.

Purpose of the proposed new legislation, which the Joint Committee is rushing to put before Congress at the present session, is to open the way for industrial electric power from nuclear sources. It would accomplish this by licensing qualified manufacturers, utilities, and others to conduct research, develop and manufacture facilities, and operate plants under strict regulation by the AEC. New version of the bill provides that all title for nuclear fuel to power the new-type plants would be held by the government as did the earlier draft.

The Changes . . . Among the host of changes made in the earlier draft, these are the most significant to the electrical industry:

- Prior to licensing new facilities for production or utilization of nuclear materials, AEC must make a written finding that such facilities have a practical or commercial value. This replaces the earlier requirement for a comprehensive report on the implications of such a development.
- More emphasis is placed on semi-annual reports of AEC to Congress. AEC may request legislative changes in these reports or at other times.
- Joint Congressional Committee is required to hold hearings during the first 60 days of each session of Congress on growth of the "atomic energy industry."
- In several respects procedures for obtaining a license to own and operate nuclear power plants are simplified and clarified.
- Corporations or associations which are dominated by foreign members or stockholders or alien management are not eligible for licensing. A much stricter section banning licenses to any applicant which had 5% or more alien stockholders, or an alien officer or director has been dropped from the bill.
- A new section has been added to permit bondholders to acquire or share in profits of facilities of a bankrupt firm.
- Maximum term of license has been extended from 25 to 40 years with authority for renewal.
- A new "no subsidy" clause has been added which prohibits AEC from paying any more than the market value of nuclear material produced in power plants. The earlier bill would have given wider latitude to fix purchase prices of such material.
- Somewhat less stringent restrictions are placed on the sale and distribution of isotopes or radiated material. AEC may exempt from licensing certain materials in this category.
- AEC is empowered to provide reprocessing facilities for fuel used by licensed plants. This was not made clear in the legislation introduced earlier.
- New draft makes it clear that the legislation would not short circuit authority of Federal Power Commission, Securities and Exchange Commission, or state utilities commissions in regulating the rate, financial, and operational aspects of electric utility companies.
- Normal patent procedure would apply on all non-weapon nuclear developments, but AEC is empowered to acquire patents in this field. AEC is also encouraged to make monetary or other awards to non-patentable developments in the nuclear field.
- Clause permitting automatic declassification of information after a three-year period has been dropped in favor of an injunction to AEC to study constantly classified information to determine exactly when the restrictions can be lifted.
- New language seeks to make it clear that electric power produced by government facilities is to be strictly a by-product of nuclear material production.

Gordon Clapp Gets New York City Post

Gordon R. Clapp, chairman of the Tennessee Valley Authority until last month, has been appointed as a deputy city administrator for New York City.

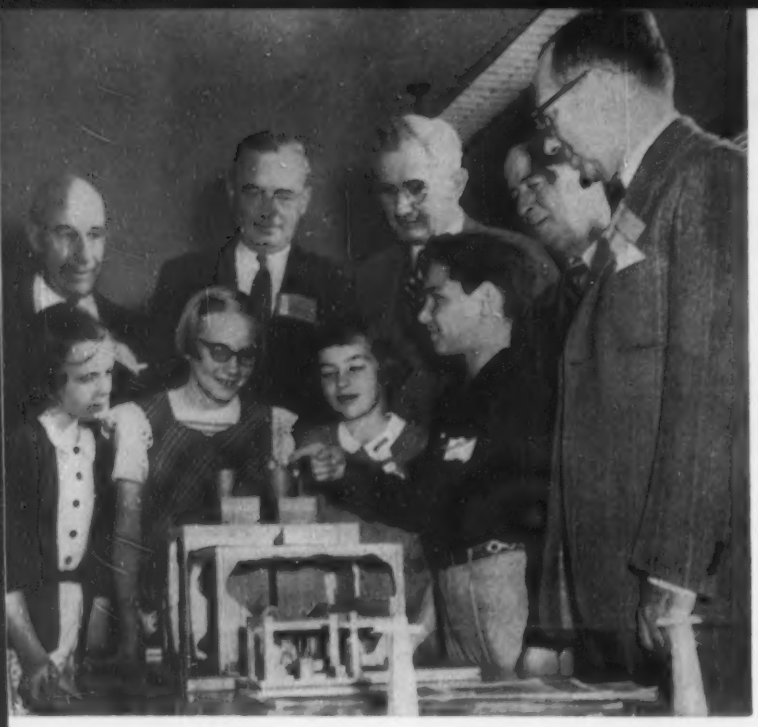
Clapp, now a resident of Norris, Tenn., will move to New York to assume his $20,000 post June 15. His work will cover two areas in the Division of Administration: management problems of public works, utilities and personnel administration.

He was named chairman of TVA by former President Harry S. Truman in 1946. He remained in that post until May 18 of this year when his term expired and President Eisenhower failed to reappoint him. Prior to assuming the chairmanship, he was successively TVA's general manager and director of personnel. He joined the TVA staff in 1933.

Clapp in 1945 was named by the United Nations as head of its Economic Survey Mission for the Middle East, where he studied and planned power and irrigation projects.

He is a graduate of Lawrence College and the University of Chicago.

GORDON R. CLAPP



Model Aids Pupils' Power Plant Study

Model of Hartford Electric Light Co's new Middletown steam plant was the center of attraction when utility executives visited the Mary Hooker School where fifth graders reviewed what they learned on a recent field trip.

Onlookers are (left to right) Milan R. Cook, assistant to the general manager; Raymond A. Gibson, executive vice president; Dr R. H. Mahoney and Leo McCrann, assistant superintendents of schools; and Kenneth P. Applegate, president of Hartford Electric Light.

Water Resources

Federal Interagency River Basin Committee upgraded to coordinate government policy

President Eisenhower has upgraded the ten-year-old Federal Interagency River Basin Committee to policy-coordinating level and renamed it the Interagency committee on Water Resources.

The committee's membership includes Departments of Agriculture, Army, Interior, Commerce, and Health, Education and Welfare—plus the Federal Power Commission. Its job will be to coordinate federal government policy on all water resource problems.

Creates Cabinet Committee . . . In addition, Eisenhower created a special three-member "Cabinet Committee on Water Resources," comprised of the Secretaries of Defense, Agriculture, and Interior. Secretary of Interior Douglas McKay was named chairman.

The cabinet committee will review all aspects of water resources policy and is to report its recommendations to President Eisenhower not later than Dec. 1, 1954.

Eisenhower asked them, however, to work with Health, Education and Welfare Department, Commerce Department, and the Bureau of the Budget, whenever this is necessary.

Presidential letters appointing the cabinet committee and upgrading FIRBC were accompanied by an interagency agreement on coordination of water and related land resources activities.

As spelled out in the documents, the new Interagency Committee is to consist of a principal policy official from each agency—such as a secretary, undersecretary or assistant secretary. For the FPC, that means either the chairman or one of the members of the commission.

Chairman for '54 . . . Commerce has the chairmanship of the committee this year, under rotation plan that governed FIRBC. A new chairman from that department was expected to call an organization meeting as soon as the six agencies had designated the policy officials to represent them. None of the Interagency members had been announced a week ago (June 1).

Top officials of Interior and other agencies have been working for months on a plan to unify the water policies of the federal government. They hope that the new dual setup of a cabinet committee and a reconstituted interagency group will be able to pull together the ramifications of government policy on water and related land resources.

John Day Bill . . .

. . . authorizing $320-million 'partnership' project is introduced in Congress

Legislation to authorize second largest of the proposed "partnership" projects—the $320-million, John Day Dam and 1.1 million-kw power plant on the Columbia River, has been introduced in both houses of Congress and referred to Public Works Committees. Hearings are expected to be scheduled after reports are received from Interior Dept, Army Corps of Engineers, and Budget Bureau.

The project, 25 miles up the Columbia River from The Dalles project and 75 miles below McNary, was included in a bill introduced by Sen. Guy Cordon (R-Ore.). Senate bill would give local utilities a year or more to form a "partnership" acceptable to the corps for joint financing.

Local interests headed by Portland General Electric Co would put up $164 million, representing value of power facilities. Besides PGE, these rural cooperatives have indicated interest in participating: Lane, Wasco, Benton-Lincoln Counties, and Western Oregon Co-op. Federal government would pay for navigation, irrigation, and flood control features.

The corps would build the dam,

which would remain federal government property. Interior would enter into 50-year contracts with local interests for sale of power in proportion to their contributions. Government-owned transmission system would distribute the power.

In attacking Cordon's bill, Sen Wayne L. Morse (Ind.-Ore.) warned that Oregon might get the short end by seeking preferential allocation of the project's power. Such action, he said, would encourage those in Washington State who advocate similar action in regard to projects there. Morse declared: "That state is way ahead of us in power development and has a greater power potential. If we permit ourselves to get into that kind of competition we will lose."

Morse also said the Cordon bill calls for a dam that would reduce the flood control function, thus increasing portion of costs chargeable to power. He said power costs would be about 90% of the total. Under the partnership proposal the government would pay 50% of the costs.

Leland Olds Testifies At Hells Canyon Hearings

As the Hells Canyon hearings went into their 12th month last week, former Federal Power Commission Chairman Leland Olds testified that the federal government should undertake the Hells Canyon project. He said that application of sound management requires "a singleness of responsibility," which only the government can give.

Olds followed Michael Straus, former Reclamation commissioner, in direct testimony. These two former Democratic officials are the last witnesses to be called by the National Hells Canyon Association in its fight for a high dam as opposed to the Idaho Power Co's plan for building three smaller dams.

"As I see it," said Olds, "the concept of comprehensive river basin development presupposes the federal rather than private administration. A river basin must be treated as a unit if maximum values are to be obtained in bringing out all the benefits of its resources." He said he agreed with a 1934 report of FPC's Special Mississippi Valley Committee which said that "engineering does not exist for its own sake but for the improvement of human living. Therefore, neither the water nor the land but the welfare of the people must be considered in developing any projects."

Olds said that the change in concept of river basin development grew out of the 1927 floods. The Army Corps of Engineers went to work building reservoirs and this action in turn affected the Federal Power Commission's attitude towards hydro developments. "It wasn't till 1937," he said, "that the commission was in full accord with the theory of full integration for river basin development which took into account flood control, navigation, irrigation, recreation and storage."

After Olds' cross-examination FPC's attorney, John C. Mason, was to present three engineer witnesses, including Lester S. Wing, regional engineer of the San Francisco office of FPC. The hearings should be over by the second week in June.

NPSS Signs 1st Contract for Missouri Basin Power

Nebraska Public Service System has signed the first contract for federally produced power under the Missouri River Basin marketing criteria announced last fall.

Interior Secretary Douglas McKay recently approved the agreement thus giving full government acceptance. Under terms of the contract Bureau of Reclamation will deliver 100,000 kw of firm power by 1956 from Missouri River Basin projects on the mainstem of the Missouri.

Initial service of 40,000 kw will begin upon completion of the fourth generating unit at Fort Randall, scheduled for November of this year. An additional 30,000 kw will be delivered beginning Nov. 1, 1955. Delivery of the full 100,000 kw will begin not later than Nov. 1, 1956.

LDJ Has Special Meaning for DP Family

Light was depicted as the symbol of prosperity, peace and truth by a 14-year-old Russian displaced person at Arizona Public Service Co's kick-off celebration of Light's Diamond Jubilee. The girl, Alexandra Bakowics, and her parents (above) were special guests at the celebration. They are shown looking at an emblem connoting the 75th anniversary of the incandescent lamp.

Alexandra's father, Jaroslaw, is employed at the utility's Phoenix power plant. The family left their home in the Ukraine at the end of World War II and after many months of walking reached the American sector of Germany 900 miles away. They came to America in 1950 and settled in New York City. But when Alexandra became an invalid because of crippling arthritis, the family moved to Arizona. This January Bakowics became an employee of Arizona PS.

IN THE INDUSTRY

If we get an industrial atomic power law at this session of Congress, a big share of the credit goes to Duquesne Light Co and the eight other bidders who offered to help build and operate the nation's first utility-size nuclear power plant. Along with the 13 industry study teams now operating in the field, these firms and industrial groups are the pioneers in the brand new field of civilian nuclear power. There is little doubt in our mind that the $45-million plant which Duquesne is to help build outside Pittsburgh will eventually become something of an historic site.

Duquesne action shows need for AEC Act change

But Duquesne and its fellow pioneers do not have to wait years for their contribution to receive nationwide recognition. In nearly every speech they have made since the award of the Duquesne contract, the Atomic Energy Commissioners have paid tribute to the courage and foresight of the bidders.

First Atomic Power Plant . . . AEC Chairman Lewis L. Strauss in a speech before the Brand Names Foundation in New York had this to say:

"The interest of private enterprise in nuclear power has been demonstrated by the number and importance of companies which submitted proposals for the first full-scale central atomic power plant . . . the most acceptable proposal came from the Duquesne Light Co of Pittsburgh."

AEC Commissioner Eugene M. Zuckert put the offers in a little better perspective in a speech last March before the National Industrial Conference Board in Los Angeles. Referring to the pressurized water reactor (PWR) which Duquesne is to help build, Zuckert said:

"This is the one in which we invited private industry to share some of the responsibility. The response we received was to put it mildly, heartening. I, for one, believe that this project will prove to be the turning point in the history of the economics of electric power in this country."

Just five months earlier Zuckert had told the conference meeting in New York of a study conducted by AEC on the willingness of private enterprise to participate in nuclear power development. This study was conducted by Commissioner Thomas Murray in 1952, and he concluded there was no "immediate prospect of large private investment in the atomic energy field."

Duquesne Catches AEC Off Guard . . . Conclusion of this study was generally accepted by the AEC as being just as true in November of last year as it had been a year earlier, but Duquesne and the other firms and groups caught AEC and many outsiders off guard with their liberal offers of participation in the PWR project.

At the hearings on the proposed revision of 1946 Atomic Energy Act before the Joint Congressional Committee on Atomic Energy, nearly every witness favoring relaxation of the law recounts the story of the bids for the PWR project. It is their best argument for immediate changes in the act to foster a nuclear power industry in this country. More than any other single action by the electric utility industry, the bids on the PWR emphasize that the time has come to let private enterprise proceed into the nuclear power field.

By adding a sense of urgency to the changes in the law, the pioneers have given the new legislation a big boost toward approval this very year. Whether it intended it that way or not, Duquesne Light is helping as much as anybody else to write the law providing for the nuclear power industry in this country.

Of course this column is disposed to add at least a "we told you so" to this little saga. In this space for the Dec. 21, 1953, issue we wrote:

"But lawmakers who would vote for changes in the Atomic Energy Act would like to see some concrete proposals from industry (for the PWR) to show that this revision of the law is not only necessary but immediately necessary."

The industry again came through. And again its up to Congress.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Coal tar creosote contains many hydrocarbons. Over 183 have been identified among which nearly two-thirds are benzenoids or their derivaties.

Pipe connections crossed will make someone's face red if the wrong transformer is sprayed when one of a bank catches fire.

Plastic pipe is being used increasingly on farms. It makes grounding of electrical equipment both important and difficult.

Thermoset plastics are very highly branched 3-dimensional networks. Thermoplastics and rubbers are essentially linear or chain-like polymers.

Sodium apparently increases greatly the aggressiveness of vanadium salts or their tendency to form deposits in oil-fired gas turbines.

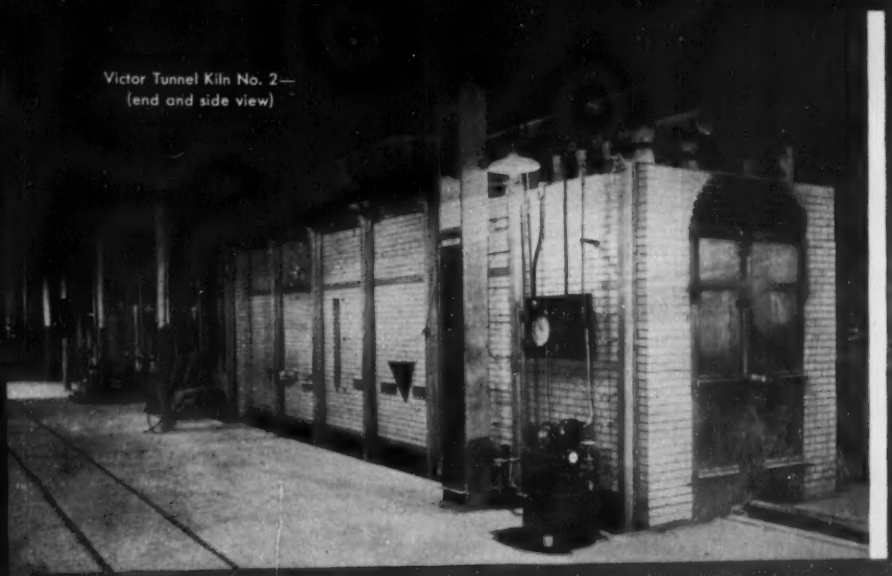
Line-to-line fault current in large station auxiliary motors can be considerably less than the inrush current where dead retransfer is employed without a residual voltage relay.

Mid-phase offset in vertical transmission configuration is desirable to prevent icing difficulties on both strain and dead-end towers.

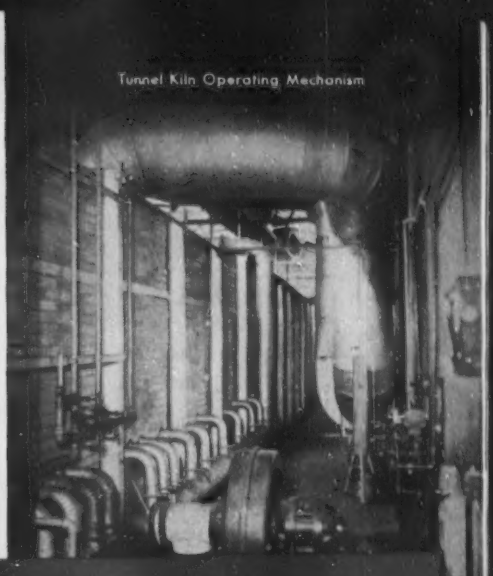
Steaming of southern pine poles results in a loss of bending strength (up to 16% in Bell system tests).

Ozone is an extremely reactive chemical present in the air from zero to 10 parts per 100 million, not enough to have any effect on chemically saturated materials but a serious hazard for unsaturated compounds like rubber (natural or synthetics).

Dragging anchors of large ships may penetrate 8½ ft in sand and 15 ft in mud. Cable laid in an arc with the bow upstream will provide slack in case the cable moves downstream with scouring of the river bottom.



Victor Tunnel Kiln No. 2—
(end and side view)



Tunnel Kiln Operating Mechanism

Another Reason Why—

VICTOR Makes Better Insulators

WE USE RECIRCULATING TUNNEL KILNS EXCLUSIVELY!

The firing process can literally make or break an insulator. By leaving nothing to chance, Victor "know-how" gives you the most perfectly fired high and low voltage insulators that money can buy.

Employing tunnel kilns exclusively, Victor research has done much to advance firing techniques. The use of re-circulation of heat to attain accurate, even temperature control, the use of optical pyrometers to measure tunnel kiln temperatures, automatic control instruments and silicon carbide kiln furniture are examples.

No wonder Victor *Purified* Porcelain Insulators are harder, denser, have more impact resistance, last longer and ultimately cost less! For the full story, send for our free booklet, "The Story of Victor and Purified Porcelain." Tells how research made possible this great insulator advance.

VICTOR NO. 245-R
(EEI-NEMA Class 56-3)
TRANSMISSION PINTYPE

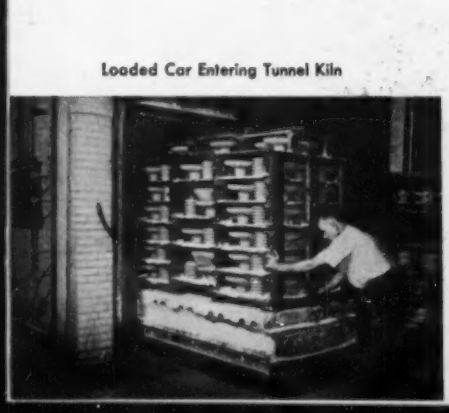
Specify

VICTOR PURIFIED PORCELAIN INSULATORS!

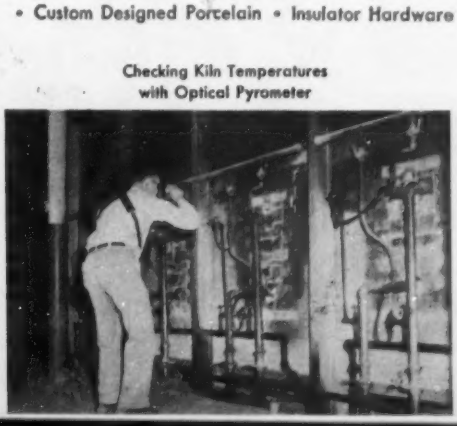
VICTOR INSULATORS, INC., VICTOR, N. Y.

Low and High Voltage Pintypes • Suspensions • Guy Strains • Spools • Switch and Bus Insulators
• Custom Designed Porcelain • Insulator Hardware

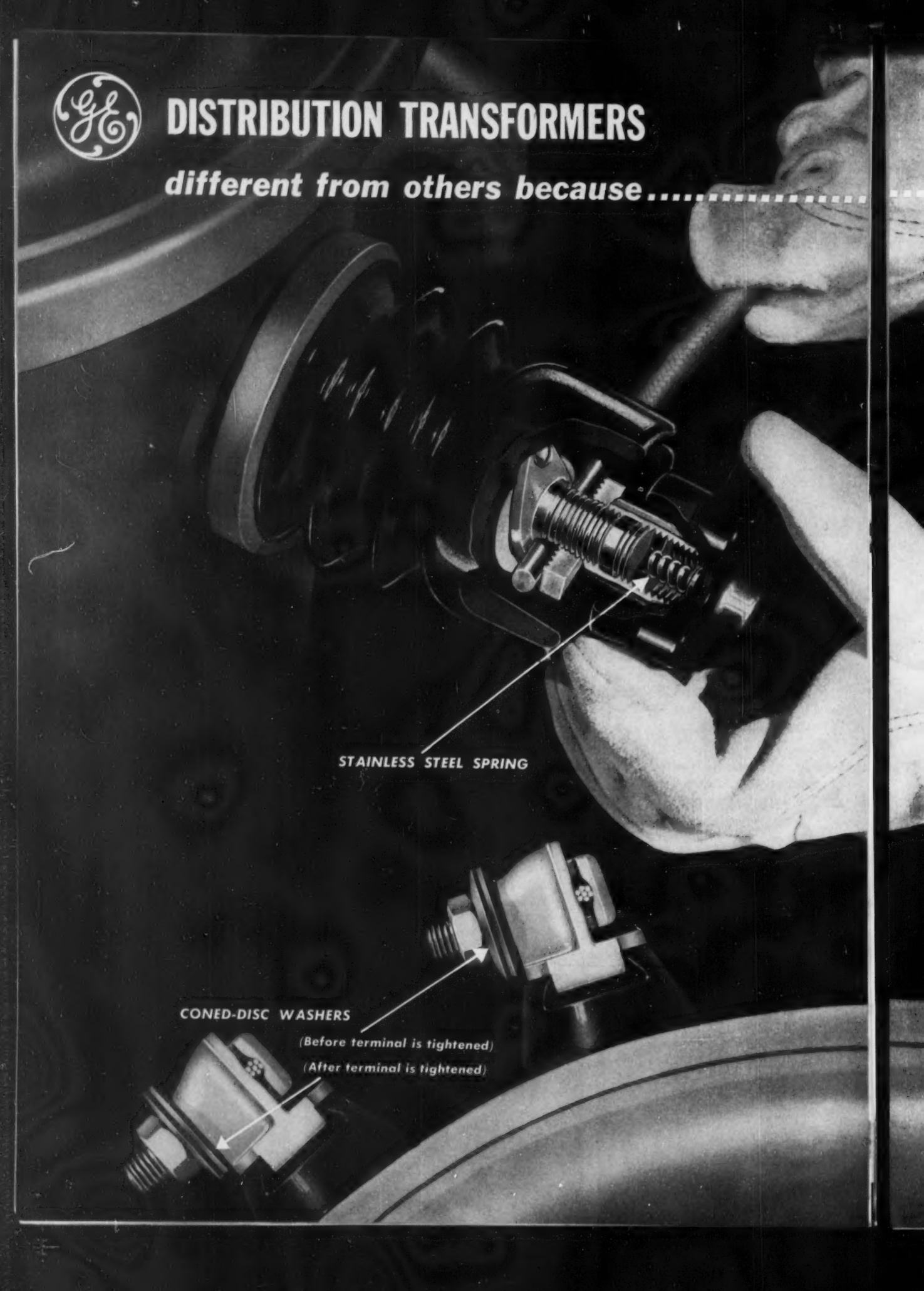
Loaded Car Entering Tunnel Kiln



Checking Kiln Temperatures
with Optical Pyrometer



Tunnel Kiln Control Panel


DISTRIBUTION TRANSFORMERS
different from others because.....
STAINLESS STEEL SPRING
CONED-DISC WASHERS
(Before terminal is tightened)
(After terminal is tightened)

...Bushing terminals handle both Cu and Al

retard corrosion... prevent loosening due to "cold-flow" and temperature changes

Whether you use copper or aluminum conductors, General Electric distribution transformers meet your needs—thanks to new terminals which handle both copper and aluminum without special fittings.

HIGH-VOLTAGE BUSHINGS mounted on tank wall have a stainless-steel follow-up spring bearing on an extra-large serrated contact surface, which securely grips the conductor and breaks down aluminum oxide. The spring maintains pressure on the conductor, even when "cold-flow" or temperature changes occur.

LOW-VOLTAGE BUSHINGS and high-voltage cover bushings, which feature Strenicor pressure terminal clamps, have two stainless-steel, coned-disc spring (Belleville) washers. These washers maintain pressure on the conductor in the same manner as the spring in the high-voltage tank-wall bushings.

ALL BUSHING HARDWARE is tin-plated to retard corrosion.

REMEMBER . . . all transformers are not alike . . . compare the General Electric plus features in the chart below and see for yourself.

For more information on distribution transformers, either unit-type or conventional, contact your nearest G-E Sales Office or agent, or write to General Electric Company, Section 431-12, Schenectady 5, New York.

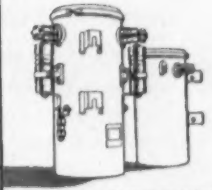
Progress is our most important product

GENERAL ELECTRIC

ALL TRANSFORMERS ARE NOT ALIKE

(make this simple comparison and see)

FEATURE	General Electric	Mfr. A	Mfr. B	Mfr. C	Mfr. D	Mfr. E
Production-line impulse testing	YES	NO	NO	YES	NO	NO
Nitrile rubber gaskets at all tank openings	YES	NO	NO	NO	NO	NO
Strenicor pressure terminal clamps	YES	NO	NO	NO	NO	NO
One-piece cover band	YES	NO	NO	NO	NO	YES
Terminals designed for both copper and aluminum conductors	YES	NO	NO	NO	NO	NO
Gapped valve-type arresters	YES	NO	NO	NO	NO	NO
Nationwide company-operated service facilities	YES	YES	NO	NO	NO	YES



UNIT-TYPE CONVENTIONAL

"Take your choice G. E. makes both"

Kuhlman Rural Distribution Transformers help provide a dependable source of power for America's Farmers

Spanning hundreds of thousands of miles of countryside, the lines of America's utilities now reach out to farms in nearly every county of the nation, bringing electricity for light and power. Electricity also runs milking machines, incubators, hoists and other farm appliances; electricity pumps water to thirsty fields and transforms barren wasteland into fertile farmland.

●

With America's harvest depending so much on a steady and reliable power supply, the equipment that carries the load must be dependable. Installing Kuhlman Rural Distribution Transformers is a safe, sure method of providing complete and certain dependability on rural lines. Made in Standard and CSP models, these units are specifically engineered for voltage regulation, economical service and maximum customer protection. They incorporate the bent iron core, developed and perfected by Kuhlman, coordinated insulation and wide oil ducts to give ample cooling. Strong, sturdy construction and careful finishing enable these hardy transformers to operate with utmost reliability and minimum attention under severe weather conditions. Utility executives can get complete information about Kuhlman Rural Distribution Transformers by writing today for Bulletin CS-401. Kuhlman also manufactures Power, Dry Type, Subway, Saf-T-Kuhl, CSP and Series Street Lighting Transformers, and we will be glad to send you our bulletins on these units also.

143-M

KUHLMAN

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICHIGAN • Southern Division, CRYSTAL SPRINGS, MISSISSIPPI

EXPORT REPRESENTATIVE: INTERNATIONAL STANDARD ELECTRIC CORP., 15TH FLOOR, 50 CHURCH STREET, N. Y. 7, N. Y. CABLE ADDRESS: MICROPHONE, N. Y.

SIXTY YEARS OF PROGRESS IN THE ELECTRICAL INDUSTRY

EEI PRESIDENT Walter H. Sammis (center) talks over the PCEA convention with Harold Quinton (left), new president of Southern California Edison Co, and J. H. Pengilly, PCEA head

Sammis Asks End of Inequities

Speaking at PCEA conference, EEI president calls for termination of tax exemptions on federal projects

The case against government in business will be won sooner and easier in the court of public opinion when the people are told of the existing problem and inequities and how they will benefit by their fair solution or elimination. This approach was emphasized by Walter H. Sammis, president of Edison Electric Institute and Ohio Edison Co, at the 37th annual convention of the Pacific Coast Electrical Association, Coronado, Calif., May 19-21. The 500 members of the convention elected R. N. Dreiman, Coast Counties Gas & Electric Co, San Francisco, as president to succeed J. H. Pengilly, Square D Co, Los Angeles.

Taxation . . . "In the interest of our customers," said Sammis, "we must continue urging Congress to remove the unfair tax exemptions enjoyed by government proprietary power business. Their customers should share in the cost of supporting government to reduce the common burden." "As substantial local taxpayers," continued Sammis, "we are interested in the efforts of local governments to tax federal property, particularly where it competes with private business. Such action would help to reveal the true costs of federal power operations and would help to show the unfairness of the so-called 'yardstick' and the uneconomical character of such operations."

To right another inequity, the EEI president emphasized that "rates charged for government-produced power should include the full cost of money. The full capital cost should be fairly allocated to power facilities by an agency concerned with the welfare of the U. S. Treasury and should include interest during construction to be more consistent with sound business principles." Sammis called for elimination of the preference and priority in the sale of federal power because he said customers of private power, rural electric cooperatives and government operations should be treated alike.

Regulation . . . Electric utilities should be regulated by the states, with regulation exerted by the federal government reduced to that minimum which is fully justifiable in the interest of the customer, he pointed out. The industry would welcome steps by the federal government to reduce the burden of overlapping regulation by simplifying its requirements and by leaving more of the job exclusively up to state commissions, said Sammis. The costliness of overlapping regulation is reflected in the charges to customers. Amendment of regulatory statutes is most urgently needed for adequate relief in the public interest, he concluded.

There is no "for sale" sign on any federal power plants, stated Ralph A. Tudor, Undersecretary of Interior, and no opportunity is being sought to dispose of any of them. "We would rather see available capital and credit go into new plants to meet the ever increasing demand for more kilowatts," he added. He said Interior is not initiating an effort to sell the Central Valley Project to California or the federal transmission lines within Arizona to that state. These states offered the proposals and they are receiving our sympathetic consideration, said the official.

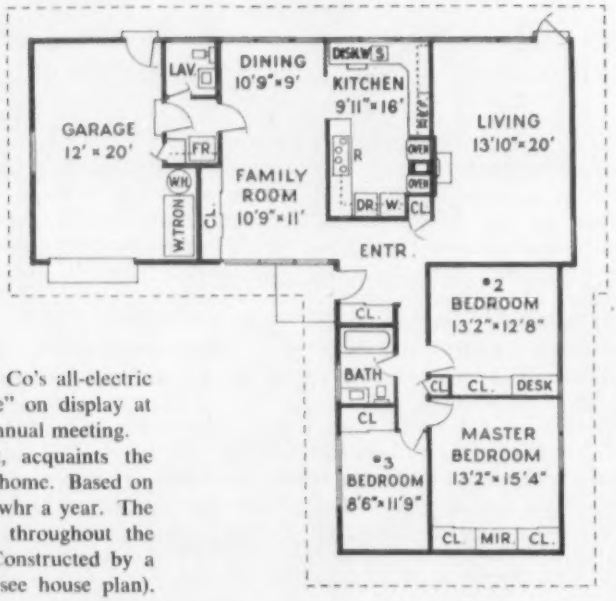
Partnership . . . In defining the "partnership" principle of the present Administration, Tudor said "First, the federal government will continue to build those projects that local interests cannot be expected to undertake; . . . second, we will encourage and join with local public and private bodies wherever a project lends itself to cooperative effort; . . . third, we will not interfere or oppose legitimate developments by public and private bodies in any region so long as these developments fit with a sound plan for the development of the region's resources."

"The same reviews of economic conditions used in the 1929-32 period are being written today. Only the names have been changed to confuse the ignorant," charged Herbert A. Leggett, Valley National Bank, Phoenix, Ariz. He said the present situation is more and more beginning to resemble the economic conditions of the late Twenties and history may repeat itself. The present Administration not only is prolonging the mistakes of the previous administration but also is repeating the errors of the last Republican administration, Leggett declared. He listed these seven beliefs as the greatest economic de-

(*Continued on page* 18)

THIS ALL-ELECTRIC, barn-red model home features latest in GE appliances. Model was on exhibit at firm's headquarters in Schenectady

Electricity Is at Home in GE's



Americans got a glimpse at General Electric Co's all-electric house when the company put its "family home" on display at Schenectady, N. Y., for stockholders at recent annual meeting.

This model, complete with GE equipment, acquaints the viewer with all the advantages of an all-electric home. Based on average use, the house would consume 23,000 kwhr a year. The house, one of seven scheduled for exhibition throughout the country, is estimated to cost about $25,000. Constructed by a local contractor, model contains 1,400 sq ft. (see house plan).

Model's Equipment . . . Kitchen's built-in major appliances can be installed at a cost of $3,000. Weathertron can be installed for $3,200. The 5-hp unit, which heats and cools entirely by electricity, consumes about 8,000 to 12,000 kwhr annually.

Wiring . . . Service entrance is 115/230 v underground to a 200-amp circuit breaker. Sub-feed breakers serve Weathertron and 3 load centers. Lights and outlets are controlled by 24-v remote control wiring system. Two master selector switches each control nine different lights and outlets from one location. Lighting fixtures and portable lamps in the house total about 7,240 w.

VISITORS wait on line to view model home's design and furnishings

MECHANISM of GE Weatherton is explained

Model House

RANGE in all-electric kitchen is demonstrated to two visitors by George Warren of Major Appliance Division

FEATURES of GE electric clock in living room are pointed out by Nela Park's Kaye Leighton

REMOTE CONTROL WIRING BOARD operates all home's lights. GE's H. H. Watson pushes button to demonstrate system

PCEA Meeting

(*Continued from page* 15)

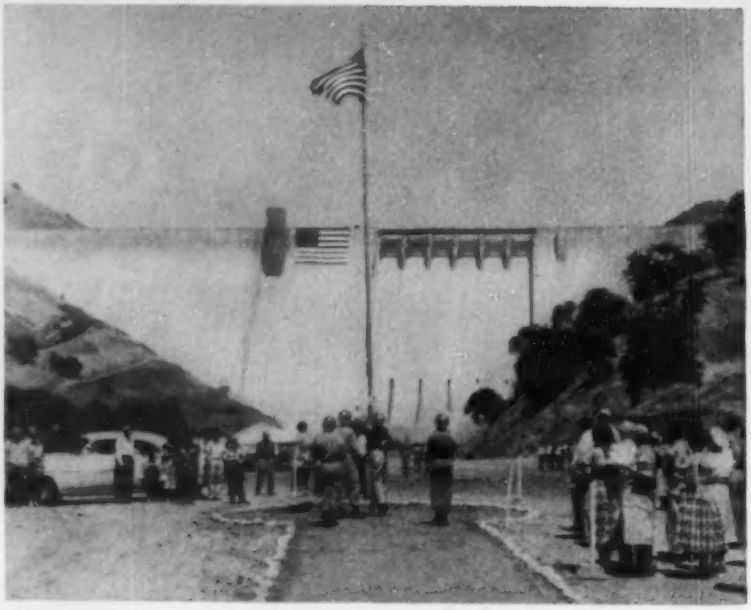
lusions: (1) Government can prevent a depression, (2) the present economy is more stable than in the past, (3) we know how to control business cycles, (4) war brings on prosperity, (5) borrowed money represents real income, (6) an expanding population automatically insures prosperity, and (7) we are a lot better off now than we ever were before.

More Power Needed in Northwest . . . The Pacific Northwest must start construction of 3-3.5 million kw of new hydro capacity between July, 1954, and July, 1960, to meet the expected 1963 winter peak, said Kinsey M. Robinson, Washington Water Power Co. In March of this year the area had about 7.1 million kw in operation and another 3.9 million kw under construction. And by the winter of 1963-64, 2 million kw of firm capacity must be in operation to carry the load, he said.

Commenting on the agreement between the five-company Pacific Northwest Power Co and Atomic Energy Commission to study the possibilities of atomic power for the Pacific Northwest, Robinson said that though this may seem strange for a hydro area, hydro projects are becoming more costly per kw of firm capacity.

Wiring . . . One of the problems of the industry is to obtain a larger share of the consumer's dollar, mainly in equipment for the home, stated J. H. Pengilly, PCEA president and Square D Co, Los Angeles. But inadequate wiring still is a great handicap and many a sale is lost because of it. This presents an opportunity for coordinated and cooperative effort by the entire industry. Furthermore, Pengilly stated, the interest and participation by some segments of the association is still not nearly as great as it should be to fulfill the mission of promoting adequate wiring and everything electrical.

In the promotion of adequate wiring, said Dave O. Slipher, Fritz Burns & Associates, Los Angeles, the electrical industry has been neglecting to educate the local and government appraisers. Adequate wiring should be added to the value of the home and be reflected in the mortgage instead of being added to the down payment, he said.



Corps Dedicates Pine Flat Dam

Army Corps of Engineers last month dedicated its $40-million Pine Flat Dam on the Kings River 27 miles east of Fresno, Calif., at ceremonies attended by about 3,000 people. Flag draped on dam (in background) is 77 x 122 ft, reported to be largest flag in the U. S.

Pine Flat was built for a future power plant, with three penstocks built into the dam. Fresno Irrigation District has a preliminary permit from Federal Power Commission to explore power possibilities at dam. Since Bureau of Reclamation is unable to negotiate contract with water users for their payment of dam's cost, it will be used this year for conservation storage. Most of dam's 360,000 acre ft of water storage is held in name of Kings River Irrigators and part for Pacific Gas & Electric Co.

'Partnership' Advocates Win Oregon Primaries

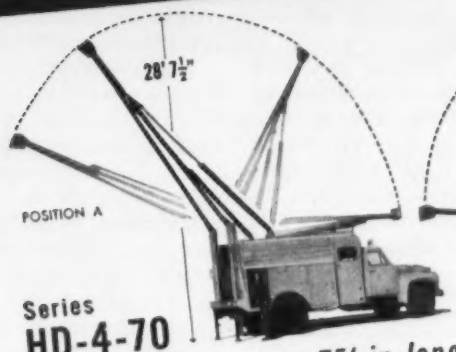
Two friends of the Eisenhower Administration's federal "partnership" power policy won nomination in Oregon's Republican primary last month against rivals who went out of their way to make federal development of the Columbia River a major issue.

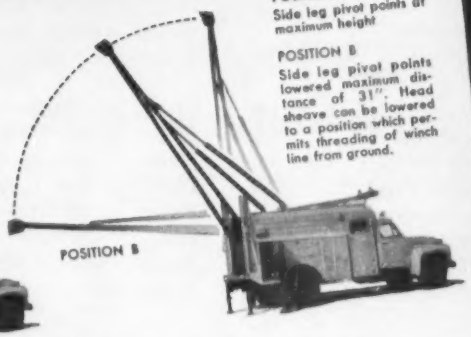
Gov Paul L. Patterson overwhelmed Secretary of State Earl T. Newbry in the gubernatorial race, better than 3 to 1 and a record Oregon majority margin. Newbry had sought to make a power policy slugfest of the election both before and after Secretary of Interior Douglas McKay made his TV-radio speech on power policy in Portland May 10. McKay's outspoken declaration for the Administration power policy was interpreted as a slap at Newbry and a gesture of blessing for Patterson.

But an even more clearcut victory for the "partnership concept" was seen in the victory of first-time candidate Thomas Lawson McCall, 41, ex-newspaper reporter, radio news commentator, and former McKay administrative assistant. McCall won the GOP nomination for the Portland Multnomah Congressional district against veteran Homer D. Angell, 79, long a supporter of federal projects in Oregon and on the Columbia. Angell, an eight-term Congressman, had helped work for partnership projects such as Cougar Dam in Oregon and also favored the five-company Clearwater River proposals, but at the last minute of the campaign spoke out strongly for a high federal dam at Hells Canyon. McCall stuck to his original view that there was room for both private and public power and a necessity for more than just federal power in the Columbia Basin.

- POWERS *American*

"Pole-Master"
HYDRAULIC DERRICKS





POSITION A
Side leg pivot points at maximum height

POSITION B
Side leg pivot points lowered maximum distance of 31". Head sheave can be lowered to a position which permits threading of winch line from ground.

Series HD-4-70

Handles poles up to 75' in length

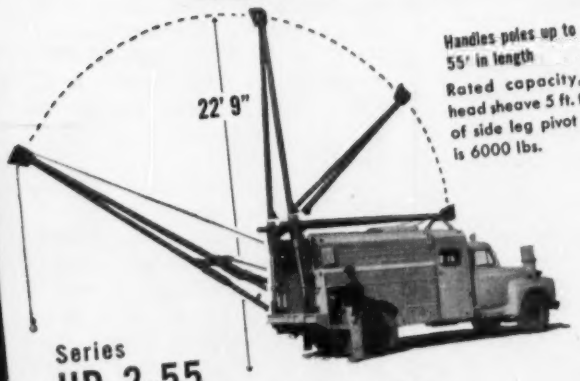
This is a heavy-duty derrick which can be operated by one man. Every movement—from carrying position to any point within the operating range—is hydraulically actuated. Shifting of control levers is the only manual requirement.

The derrick can be spotted in any position selected by the operator . . . and can be moved under load.

What's more, the position of the head sheave can be raised or lowered a distance of 31" . . . hydraulically . . . without changing angle of elevation.

With head sheave fully extended, 5 ft. to rear of side leg pivot points, the derrick has a capacity of 9000 lbs.

Complete details are given in Powers-American Bulletin No. 407. A copy, with quotation, is yours for the asking.



Handles poles up to 55' in length

Rated capacity, with head sheave 5 ft. to rear of side leg pivot points, is 6000 lbs.

Series HD-2-55

Operation is completely hydraulic. Insertion and removal of locking pins, and shifting of control is the only manual requirement.

The derrick can be spotted in an unlimited number of positions, and moved while under load. It will lift loads to body cargo area.

Descriptive Bulletin No. 405R, with quotation, will be sent on request.

SERIES HD-2-40 Same as above, with 20' 10" ground-to-head sheave height.

- LIVE BOOM — CAN BE OPERATED UNDER LOAD
- HYDRAULIC HEIGHT ADJUSTMENT
- CAN BE USED WITH SINGLE-DRUM WINCH
- NO BODY LOAD AREA OBSTRUCTION — NO DANGEROUS EXPOSED MECHANISM

POWERS-AMERICAN DIVISION

McCABE-POWERS AUTO BODY COMPANY

5900 NO. BROADWAY • ST. LOUIS 15, MO.
428 LATHAM SQ. BLDG. • OAKLAND 12, CALIF.

Hydro Plant Runs Automatically

Tenkiller Ferry Plant of Army Engineers in Oklahoma uses three types of controls, code-selector type supervisory, automatic synchronizing, and all-electronic load frequency. Ft. Gibson Plant is control station

H. W. CLAYBAUGH,
Engineer, Southwestern Division, Corps of Engineers, Dallas, Texas

Automatic control of an advanced design for a two-unit, 35,790-kva plant is being provided at the unattended Tenkiller Ferry Plant. Code-selector type supervisory control and automatic synchronizing, operating since November, will be combined with all-electronic load-frequency control to regulate the two 17,895-kva, hydroelectric generators.

Tenkiller Ferry Plant, part of a Corps of Engineers multi-purpose project on the Illinois River in Oklahoma, is connected to Ft. Gibson Plant, another Corps multi-purpose project on the Grand River, by a 30-mile, 154-kv transmission line. This line interconnects with the Oklahoma transmission network and its interconnections in the southwestern area at a switching station near Gore, Okla.

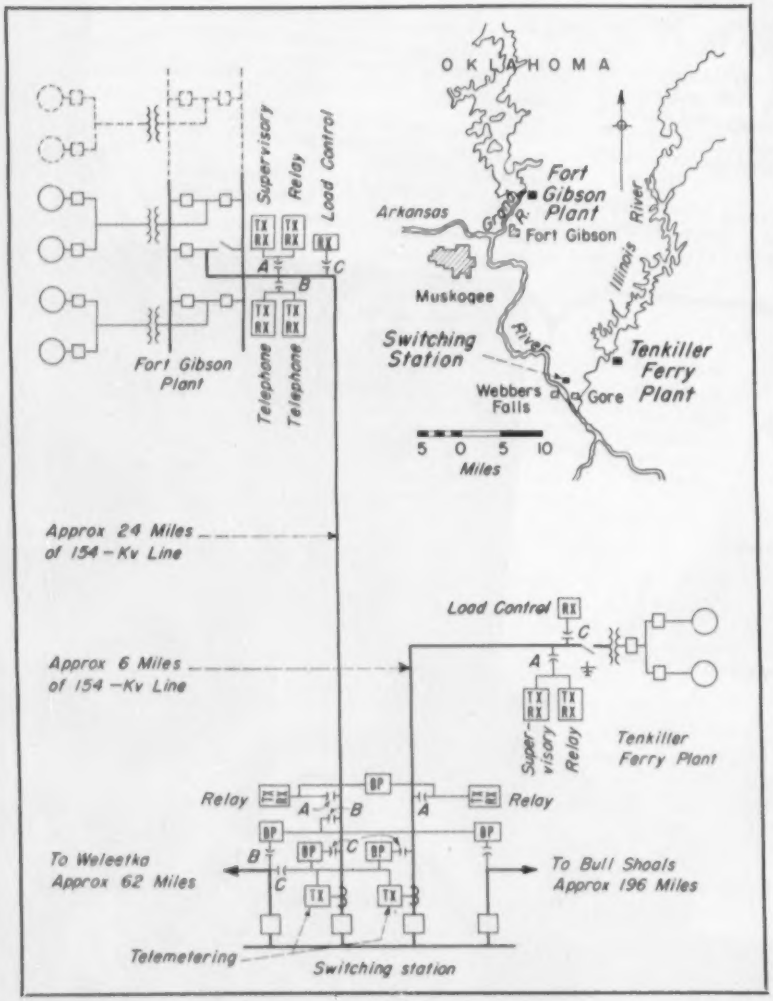
The Tenkiller-Ft. Gibson line handles the power-line carrier for supervisory and load-control functions that regulate the unattended Tenkiller Plant. Carrier intelligence by-passes the switching station.

For normal operation, the "supervisory-local" control switch at Tenkiller is maintained in the supervisory position so that the Ft. Gibson operator may start either or both generators in sequence. Units are automatically brought up to speed-no-load and synchronized to the transmission line. Plant loading may then be controlled manually by supervisory or automatically by load-frequency.

Load control will be determined by interconnected system requirements with main control at the Public Service of Oklahoma load dispatching office in Tulsa. Intelligence of continuous frequency-shift type will be received by power-line carrier at Ft. Gibson for the combined requirements of Ft. Gibson and Tenkiller. Automatic control equipment at Ft. Gibson will retransmit Tenkiller requirements over another carrier channel.

Under automatic load control Tenkiller Plant will operate as if it were another generator at Ft. Gibson. Generators at both plants respond to load changes simultaneously and in proportions predetermined by equipment ratio adjustments. Load on Tenkiller units will be equally divided. With both plants operating at rated head and some overload, about 90 Mw is available. This capacity with load control participation setters equalized may be used for "fringe" loading.

Similar load control equipment is being manufactured for the Corps of Engineers Norfork hydroelectric plant on the North Fork of the White River in Northern Arkansas.



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Reprints of this advertisement are available.

ENGINEERING

ITS ULTIMATE OBJECTIVE

By H. P. Sedwick, Executive Vice President of Commonwealth Edison Company of Chicago and President of its Public Service Company Division.*

It seems to me the current emphasis on the shortage of engineers may result in creating too great an evaluation of engineering education as an end rather than a means. Those of us who have had long experience know that the greatest personal satisfaction of being a member of the engineering profession comes from those opportunities of being helpful to our associates and our communities.

The individual engineer's ability that breaks through existing barriers of knowledge produces for him, of course, an adequate reward for the efforts expended. But the greatest satisfaction comes from being a member of a team which carries on to broader goals than the individual may hope to attain.

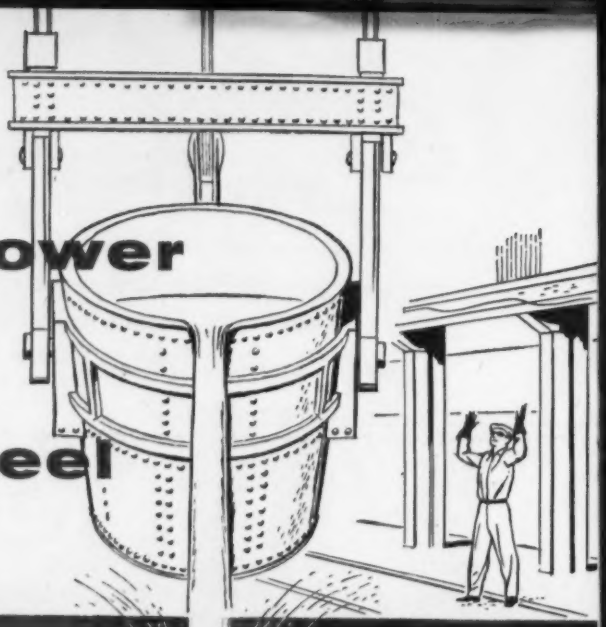
This leads me to the conviction that each of us in the engineering profession, particularly those who have had long experience, can well afford to consider whether he is devoting a fair share of his time and resources to constructive group activities.

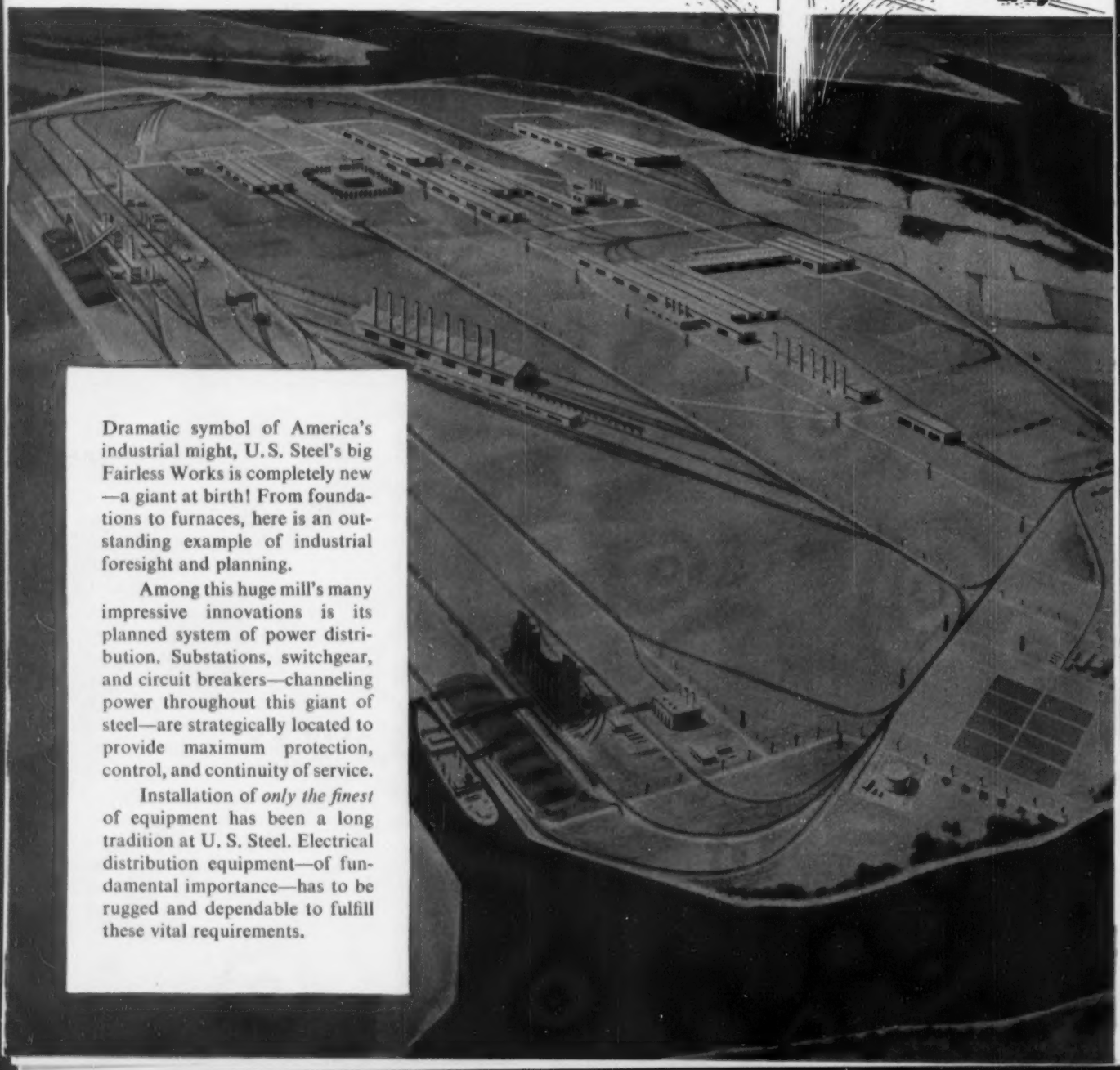
G&W

G&W ELECTRIC SPECIALTY CO.
7780 Dante Avenue, Chicago 19, Illinois

**Mr. Sedwick has spent his career in the electric and gas utility business. He is a former President of Western Society of Engineers; a Trustee of Illinois Institute of Technology; and member of the Board of The John Crerar Library.*

Pouring power into a giant of steel





Dramatic symbol of America's industrial might, U. S. Steel's big Fairless Works is completely new —a giant at birth! From foundations to furnaces, here is an outstanding example of industrial foresight and planning.

Among this huge mill's many impressive innovations is its planned system of power distribution. Substations, switchgear, and circuit breakers—channeling power throughout this giant of steel—are strategically located to provide maximum protection, control, and continuity of service.

Installation of *only the finest* of equipment has been a long tradition at U. S. Steel. Electrical distribution equipment—of fundamental importance—has to be rugged and dependable to fulfill these vital requirements.

at U.S. Steel's new FAIRLESS WORKS

kilowatts for a colossus feed
through switchgear and circuit breakers built by I-T-E

Some 70 modern indoor and outdoor I-T-E Unit Substations transform and distribute power throughout the mill. I-T-E Low-Voltage and Metal-Clad Switchgear, as well as Heavy-Duty I-T-E Circuit Breakers, guard the many critical steel processes.

From the start, I-T-E gave important engineering assistance in the preparation of specifications and in expediting *switchgear* orders for the Fairless Works. As a result of this close cooperation, power distribution equipment was on the ground *when needed* to fit right in with tight construction schedules.

Traditionally a supplier of U. S. Steel, I-T-E is proud of its place as a *major* contributor of quality power distribution equipment for the new Fairless Works.

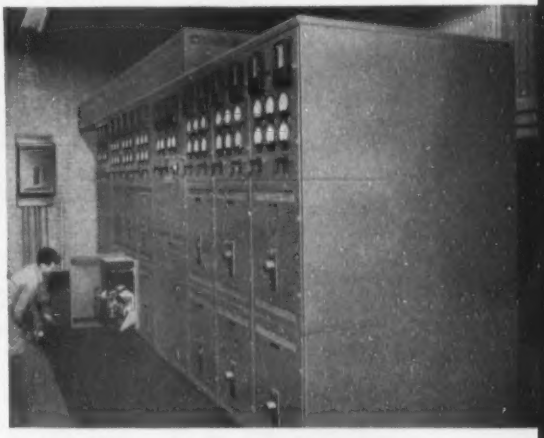
AT FAIRLESS—

I-T-E Switchgear protects:

rolling mills	**open hearths**
coke ovens	**maintenance shops**
power house auxiliaries	**office building**
billet mills	**car dumper**
strip mill	**ore dock**
blast furnaces	**oil bulk storage**

For details, contact the I-T-E field office nearest you. Look in your classified directory under "Electric Equipment."

I-T-E METAL-CLAD SWITCHGEAR
installed in cold mill for 2400-volt distribution.



I-T-E LOW-VOLTAGE SWITCHGEAR
installed in sheet and tin mill for 480-volt distribution.

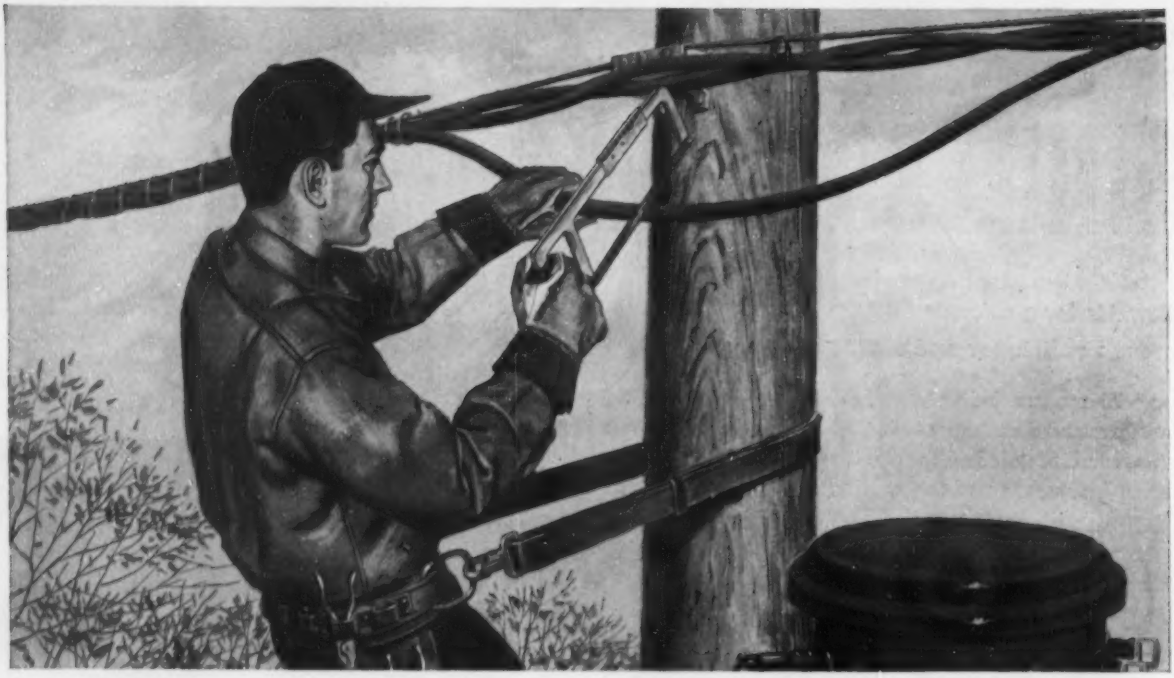
I-T-E HEAVY-DUTY CIRCUIT BREAKERS
Types MT and OH, used for DC sectionalizing in billet mill.

THE SYMBOL OF QUALITY SWITCHGEAR

I-T-E CIRCUIT BREAKER COMPANY

19TH AND HAMILTON STREETS, PHILADELPHIA 30, PA.

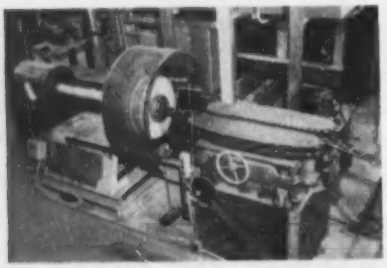
SWITCHGEAR PRODUCTS



Connections are easier to make

WITH G-E REVERSE-LAY PREASSEMBLED AERIAL CABLE

General Electric reverse-lay preassembled aerial cable installed on the lines of Con Edison near Hartsdale, Westchester County.



Reverse-lay machine in operation at General Electric wire and cable plant in Bridgeport, Connecticut.

Each conductor of a General Electric reverse-lay preassembled aerial cable has sufficient slack, when unwound between reversal points, to make the necessary connections for transformers, cut-outs, or laterals. These reversal points are spaced five feet apart, so that one will always be within easy reach of a lineman on a pole.

G-E Super Coronol* aerial cable has the extra capacity needed for growing loads. The copper temperature rating up to 8000 volts is 85 C, with an emergency rating up to 115 C depending on the voltage. Voltage regulation is improved because reactances are balanced and are lower than with an open wire line. As a result, greater load-carrying capacity is obtained with preassembled aerial cable on circuits where voltage drop is a limitation.

A preassembled aerial cable installation is stronger than an open wire installation because of the strength of the messenger. Preassembled aerial cable also gives you the advantages of minimum tree trimming and neater appearance because cross arms and insulators are eliminated.

For more information on G-E reverse-lay preassembled aerial cable for use on primary and secondary feeders, see your Wire and Cable specialist or write Section W135-627, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

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Progress is our most important product

GENERAL ELECTRIC

ENGINEERING MEETING

PEA Committees Weigh Capability

System Planners Study Economics of Replacing Old Generation
Prime Movers Survey New Generating Facilities
T&D Members Bolster Transmission

Problems of new system capability were the focus of interest at three recent Pennsylvania Electric Association meetings. The System Planning Committee at Hershey, Pa., weighed the economies of replacing old generation with efficient new plants, and methods of economic dispatch. Prime Movers committeemen explored new generating installations at Niles, Ohio, and New Castle, Pa. And Transmission and Distribution Committee at Bedford, Pa., studied reconductoring vs bundling to boost capability of existing transmission.

Plan Generating Economies . . . When do economies from engineering improvements justify writing off investment in old but serviceable generation? That question, and others related to it, stimulated the System Planning Committee.

New capacity in excess of load requirements is being installed in a program that already has shut down 33 of over 100 units 12.5 Mw and smaller for several eastern systems. Total production cost of the new stations, said C. A. Carpenter, Pennsylvania Power & Light Co, is below the operating cost of the old units.

But progress can be slowed by several other complications, he noted. These might differ between companies, but could include such items as: need to preserve station sites for future development; steam heating contracts; customers requiring 25 cps; fixed charge accounting.

Economy through optimum use of generation and transmission facilities was discussed by Dr E. L. Harder, Westinghouse Electric Corp, Dr L. K. Kirchmayer and R. M. Butler, both of General Electric Co. Dr Harder said, "Precalculated dispatch curves include transmission losses in the economic dispatch of generation. However, recent studies have provided methods for using a single family of curves to obtain good approximations for other operating conditions. Use of penalty factor and economic dispatch computers will provide further savings."

Losses Influence Design . . . Large blocks of power, longer distances, expanding interconnections, and rising costs all work to create value for transmission losses, Dr Kirchmayer said. Expressing these losses in terms of power input and system coefficient promotes rapid analyses. Network analyzers and digital calculators solve a 12-generator problem in three hours, he said. And system savings can run up to $100 annually per Mw of capability.

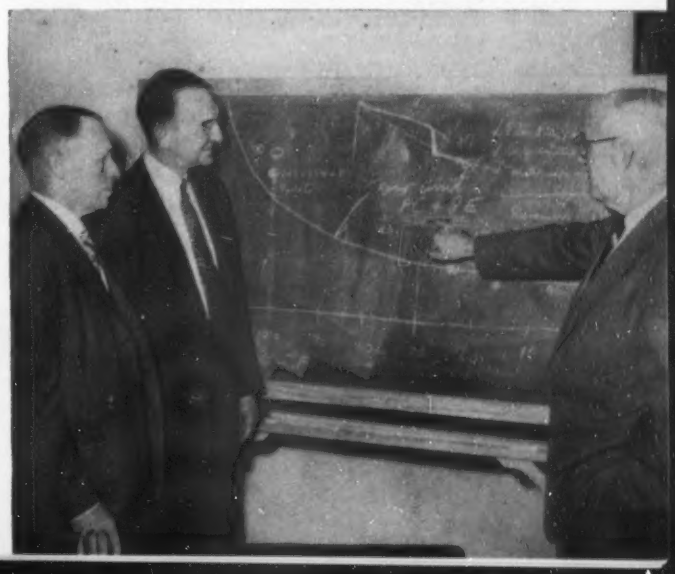
Future generator sizes and line loadings must be considered in transmission design, R. M. Butler said. While larger conductors may appear to be desirable, transient stability and sleet melting also must be considered. With lines built 20 years ago the question is not alone whether they should be re-conductored, but also whether they can be taken out of service for this work.

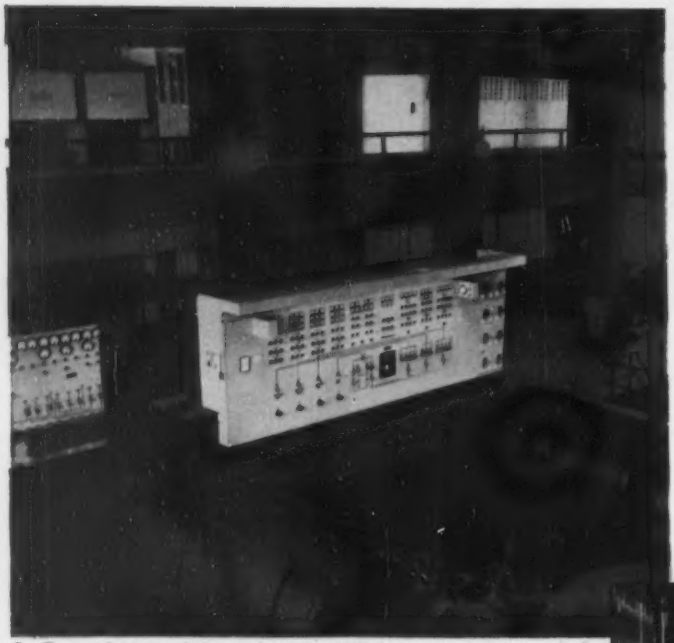
Evaluation of losses by methods compatible with rate making was advocated by S. E. Wertheim, Cleveland Electric Illuminating Co. Ideal objective would be the "specific dollar value to supply a kva of loss at a given point on the system." But the practical method is to determine the kw and kwhr values at various levels in the system by allocation of incremental costs, he said.

Capitalized evaluation of losses is important in equipment specifications, said P. B. Speer, Pennsylvania Transformer Co. Evaluation places different requirements on transformers at the generating station, at a distribution substation, on a distributing circuit. Designers can vary watts and vars within certain limits, he said, but extremes boost equipment costs. Forced cooling, below normal exciting current, and special noise limitations all tend toward greater losses.

Engineers View New Generation . . . One new plant (Niles) and one recently expanded plant (New Castle) of Ohio Edison Co were visited by the Prime Movers during their two-day meeting. R. W. Parkinson, Commonwealth Associates, explained omission of evaporators and resort to monobed demineralizer at the 250-Mw Niles plant (2 units) as well as omission of economizers because of the air temperature required for operation of cyclone furnaces. The latter (4 per boiler) are 9 ft in diameter, the largest so far installed. He said the river flow was admittedly below the value normally appropriate for a plant of this size and the

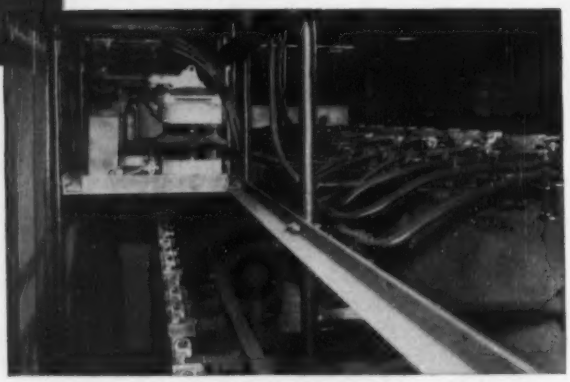
PRODUCTION COST is explained to Vice Chairman J. A. Thielman, Chairman W. H. Osterle by C. A. Carpenter, at planning meeting





HAGERSTOWN SPECIFICATION:

no service interruption during installation . . . or after



1. General view of the turbine hall. The new distribution control board is in the center, the old control board is at the left, and the old switchgear is above it on the balcony.

2. Cable connections at main and auxiliary station service breakers. Surge protective equipment for station service bus is at left.

CABLE SPECIFICATION: *Okolite-Okoprene*

Specifications for the expansion and modernization of the Municipal Electric Light Plant of the City of Hagerstown, Maryland, were made unusually complex by the absence of auxiliary power sources. Interruption of service was impracticable and therefore considerable engineering study and planning by Albert C. Wood Associates, consulting engineers, were required to solve the design and construction problems involved.

Installation of the new 5,000-KW, 13.2-KV steam turbine generator, it was determined, would overstress the old open framework and concrete cell switchgear. Therefore, new 2.4-KV and 13.2-KV metalclad switchgear was installed, and arrangements were made to tie-in the new switchgear by paralleling circuits. The new equipment was energized a circuit at a time.

All material specified for the installation was selected only after extensive evaluation of reliability and suitability. *Okolite-Okoprene was chosen for all cable requirements of the project.* Okolite-Okoprene was used on all switchgear, control board, generator and exciter equipment as well as bus tie transformers and sub-stations.

Recognized throughout the power industry for outstanding dependability and long service life, Okolite-Okoprene exceeds industry standards for quality and durability. Write for Bulletin EW1075 for complete information on the outstanding advantages of Okolite-Okoprene rubber-insulated cables for high voltage use. The Okonite Company, Passaic, New Jersey.

insulated cables

2006

paucity may entail some sacrifice of vacuum in hot weather. The Niles plant is costing $138 per kw of net capability.

Sixty unit years of operating experience have been accumulated by the 26 cyclone furnaces now operating and the growing-pain period has been passed. Four are operating on the Eastern seaboard according to R. K. Allen, Babcock & Wilcox Co. He looks toward penetration west of the Mississippi as coal production of that area quadruples in the next 15 years. Meanwhile, attention is being given to more extensive use of oil or gas fuel with later resort to coal as well as increase in practice of returning flyash to the cyclone to ease disposal problem.

Operating Problems Solved . . . Slag tanks proved to be one source of trouble in getting the plant tuned up and Supt Glen Curran intimated that integrating them with cyclones and boilers might improve behavior. In detailing some 12 outages since the beginning of the year he mentioned one involving burned cyclone tubes due to inadequate supply of air. Some difficulty was experienced also in maintaining equalized flow of coal to the four cyclones.

Round-table discussion was diversified but focussed on stack costs, feed pump spares, working coal storage, coal weighing, water treatment and corrosion protection of air heater tubes. Stacks 250 ft high were reported cheapest if of concrete on the ground, next in order brick, and steel most expensive if on the roof. Reliability of boiler feed pumps has become so reassuring that two of "half-size" and no spare are deemed adequate since one alone can be speeded up for considerable increase in output.

Some sentiment was recorded for reliance on working coal brought in dependably on conveyors as consumed. Coal weighing appears to remain an unsatisfactorily solved problem. Samples of glass- and ceramic-lined air heater tubes attracted attention as offering longer life because of the superior corrosion resistance. Survey of power plant insurance practices showed startling lack of uniformity in nature and extent of coverage.

Booster Transmission Capability . . . Re-conductoring old transmission lines to boost capability helps to overcome the difficulties in securing new rights-of-way, W. E. Wilkinson told the Transmission and Distribution Committee. In one case 556.5 MCM 24/7 ACSR replaced 4/0 hard-drawn stranded copper with practically identical sags on a 110-kv double-circuit tower line of the Consolidated Gas, Electric Light & Power Co in Baltimore. But the increased vertical, transverse, and longitudinal loading required 22 tons of steel to reinforce 54 towers.

Bundling to boost capability of a 115-kv transmission line was reported by P. L. Lumnitzer, Pennsylvania Electric Co. Existing conductors are 266.8 MCM 6/7 ACSR. The second conductor will be similar and held at 13 to 15-in. spacing by insulator yokes and mid-span spacers not over 200 ft apart. Pre-stressing the new conductor to approximate service loading of the existing conductor is expected to eliminate unequal sags in the future.

A new graphical method for computing stresses and sags of ACSR line conductors was described by H. R. McCracken, Anaconda Wire & Cable Co. Difficulties arising from differences in temperature coefficients and elasticity of aluminum and steel are resolved by applying simple templates to catenary stress curves.

Scale models and relief maps were extolled by W. C. Sontum, vice president, Pennsylvania Electric, as visual aids to engineering and operation. Examples exhibited were a switching station model which disclosed insufficient lighting shielding, and a relief map which assisted in route selection in mountainous terrain for a new 230-kv line.

SPACER FOR BUNDLED TRANSMISSION is described by P. L. Lumnitzer, Penelec, to T & D Chairman C. H. Schafer, Pennsylvania P&L, and Chairman-elect R. C. McKee, West Penn Power

Distribution Swings to Aerial Cable . . . Aerial cable will be used extensively in future distribution, according to R. C. Graham, Rome Cable Corp. Pre-fabricated or spinner-assembled cable is gaining in the 5 to 15-kv primary circuit field, he said. And aluminum or ACSR offer advantages, although they are little used in cable today. Lowest cost is achieved with ozone-resisting rubber insulation, shielded by metallic tape for 15 kv and by messenger and binder alone for 5 kv.

For secondaries, Graham proposed long spans of triplex with aluminum conductors up to 4/0 supported by a high-strength neutral. Polyethylene offers advantages of abrasion resistance and lower cost for insulating service cables; with nylon covering it makes good tree wire, he said.

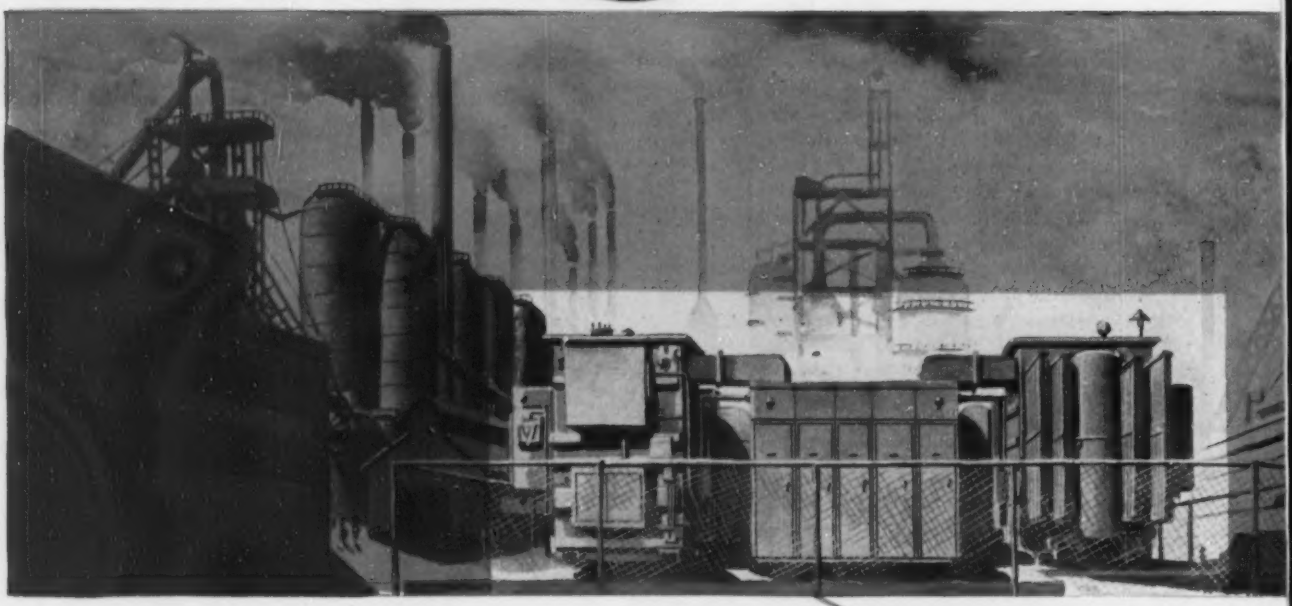
Discuss Operating Problems . . . Floating the neutral of Y-delta banks of distribution transformers was supported by H. E. Campbell, General Electric. Motor stalling and damage from overcurrent when one primary fuse blows can be prevented by protection in all three phases or by connecting motor windings in delta. Transformers are protected against overload when one phase fuse blows, when a line-to-neutral fault occurs, or when unbalance occurs because another bank loses one primary fuse.

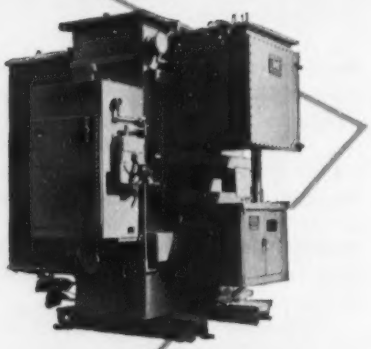
But PP&L has grounded Y-delta banks for over 30 years with desirable results, stated Glen Appleman. Neutral grounding is imperative for four-wire delta service, he said. And the ability of these banks to supply triple harmonic current helps to maintain waveform where substation 12/4-kv banks are Y-Y. Experience has disclosed a few burnouts where 3-phase banks attempt to carry single-phase transformers on an open phase, but none can be attributed to voltage unbalance.

Prevalent 120/240-v secondaries can be expanded economically to serve growing residential loads, said H. G. Barnett, Westinghouse. Three-phase 120/208 v is generally more costly and 240/480 v faces practical limitations which may make it undesirable. Voltage drop and flicker data indicate secondary banking as the solution for large motor-driven appliances.

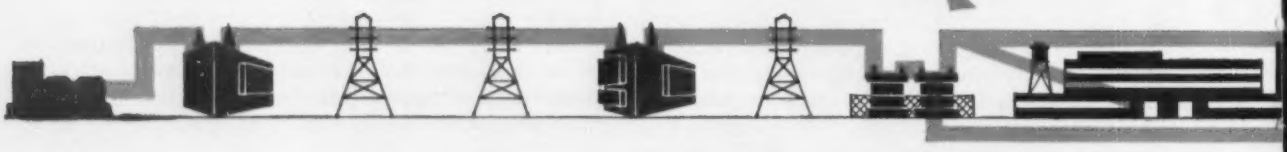
MOLONEY ELECTRIC

MOLONEY. . .





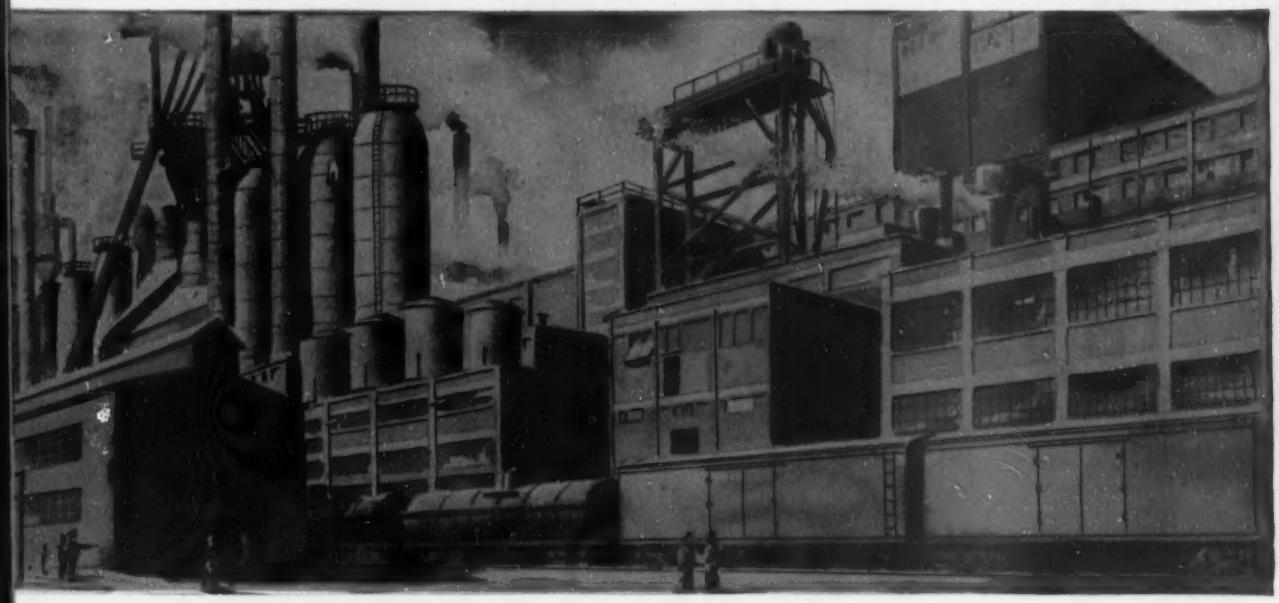
2500/3125 Kva Class OA/FA Load Ratio Control Transformers, three phase, 60 cycle, rated high voltage 34500 volts delta with disconnect switch, low voltage 5018 volts delta with plus or minus 10% regulation in 32 steps of ⅝%.



SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES

For years the name Moloney on a transformer has meant a better product. As utilities have grown and become more complex, so have transformers. All this expansion in the power field has been paralleled by expansion here at Moloney. Many utilities feel that Moloney Transformers are the best you can buy. They are right, because—

. . A L L A L O N G T H E L I N E !



Take, for instance, Load Tap Changing Equipment; With dependable Moloney Automatic Load Tap Changing Equipment, a well regulated voltage system will result which offers advantages to both utility and consumer. The consumer advantage is trouble free functioning of equipment utilizing designed performance. The Utility advantage is utmost power delivery at times when power demands are profitable.

Moloney Load Tap Changing Equipment provides a positive power supply at a constant voltage. Only Moloney Load Tap Changing Equipment has the exclusive principle of reactor by-pass switching.

Available for Step Voltage Regulators, Regulating Transformers, Load Ratio Control Transformers, Phase Shifting Transformers or Special Applications.

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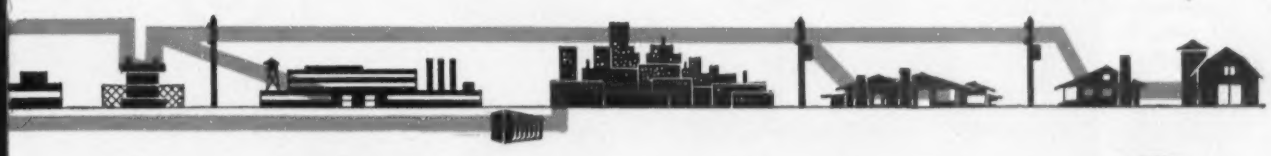

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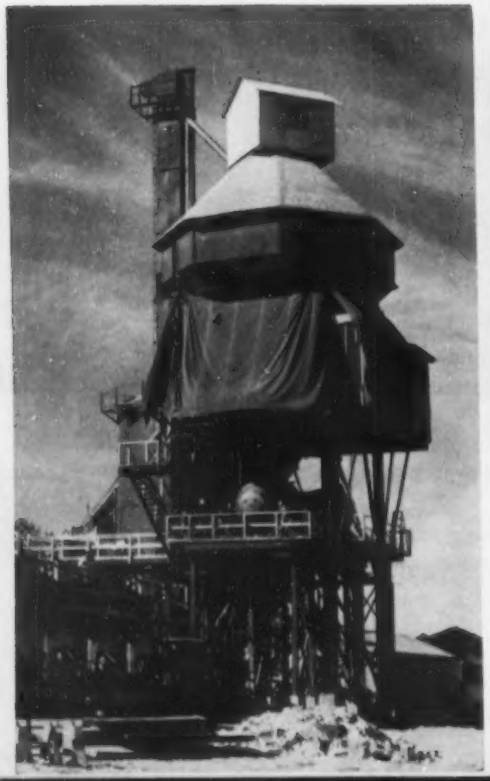
AT ST. LOUIS, MO. AND TORONTO, ONT., CANADA

AERIAL VIEW of Roanoke Rapids power plant site in North Carolina looks southwest. River flows from right to left R. L. Towe

A year after the long fight ended:

Vepco's Power Dam Is Rising

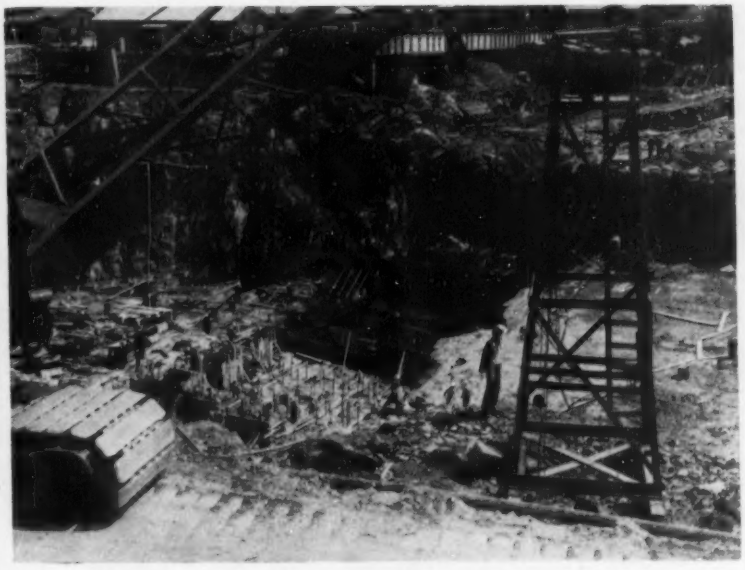


WOODEN MOLDS, around which concrete for the dam will be poured, are prefabricated at the site

CONCRETE MIXING PLANT, left, about to load concrete hopper car which Diesel will pull to dam site

CONCRETE SPILLWAYS are under construction at north side of power station. Work trestle is seen at right, background

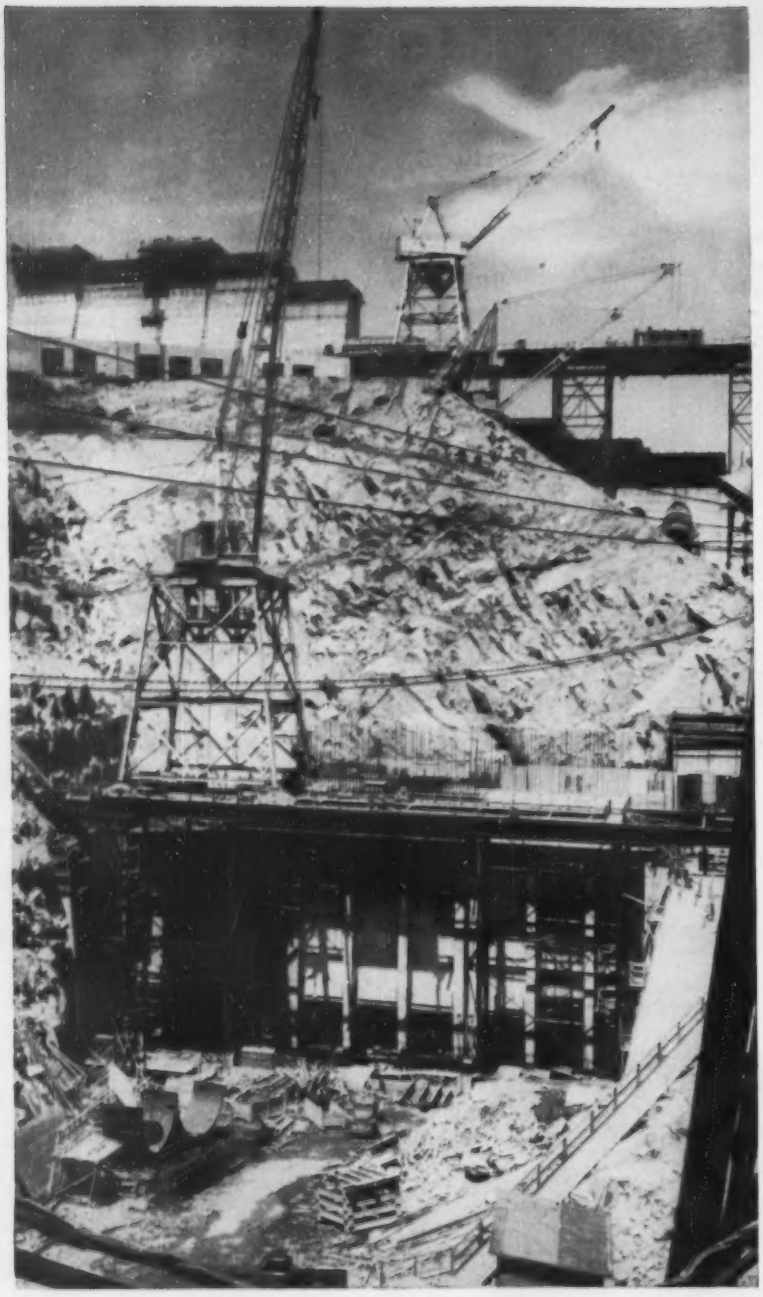
at the Roanoke Rapids Site



EXCAVATION for plant itself has been dug and part of foundation poured. Lights on tower are for night work

Just a little more than a year after the U. S. Supreme Court ruled Virginia Electric & Power Co could build a power plant at the much-disputed Roanoke Rapids site in North Carolina, the outlines of a hydroelectric dam are beginning to take on a recognizable shape.

By 1956, Vepco estimates, the $30 million, 91,000-kw hydroelectric project will be completed. This will be just about eight years after the company first made known its plans to build at Roanoke Rapids. It filed an application for a Federal Power Commission license Oct. 6, 1948, thereby joining battle with the U. S. Department of Interior, which had marked out the site as part of a federal basin development program. FPC granted the license Oct. 1, 1951, and Interior, then piloted by Secretary Oscar Chapman, a Democrat, took the case to court. Chapman contended Vepco had no right to build, since Congress had approved Interior's general plan for development of the Roanoke River basin. After a lengthy fight that took the matter to the highest court, Vepco's license was upheld.



Folsom Powerhouse Shaping Up

Power plant at Folsom Dam project in California takes shape as construction crews push to meet a target date which will permit operation of the first of three 54,000-kw generators by February 1955. Of reinforced concrete, the semi-outdoor type hydroelectric power plant will be constructed mostly underground.

First monoliths of the dam are seen in the background. Concrete pouring is about 75% complete. The dam is an Army Corps of Engineers project and the powerhouse a Bureau of Reclamation project.

Folsom Dam is located on the American River approximately 20 miles east of Sacramento.

POWER BRIEFS

● International Joint Commission report favoring a $200-million hydro power development in the St. John River Basin has been transmitted to the Canadian and United States governments. The project, which would require about ten years to complete, involves rivers running through New Brunswick, Maine, and farther south in the U. S. St. John Basin is reported to have a potential hydro capacity of more than 1 million hp.

● Twenty-year contract between Bonneville Power Administration and California Pacific Utilities Co for service to its eastern Oregon division was signed earlier this month by BPA Administrator William A. Pearl. The contract, patterned after agreements executed with other Pacific Northwest private utilities, represents a reservation by the government of firm power to the utility after commitments to public agencies and long-term industrial users have been met.

● Florida Power Corp plans to install in 1956 a 75,000 kw turbine in the Suwanee River Plant if it is successful in getting natural gas into that area to use as fuel. Florida Power has negotiated an agreement with South Georgia Natural Gas Co for a gas contract subject to Federal Power Commission's approval of the fuel company's certificate to construct a gas transmission line.

● Publication of Northwest Rural Electric News for REA's and PUD's in Washington, Oregon, Idaho, and Montana was scheduled to begin last month at Portland. The publication, to have a tabloid newspaper format, is being sponsored by the Oregon Rural Electric Co-operative Association. Henry H. Alderman, who retired recently as executive officer of Bonneville Power Administration, will direct operations of the publication.

● Stockholders of Inland Empire Rural Electrification, Inc, Spokane, Wash., have shortened the name of the cooperative to Inland Power & Light Co. Co-op's name was changed to avoid confusion with the Rural Electrification Administration.

● Ontario Hydro Electric Commission has started field tests to determine soil conditions and other characteristics on the power house site of the St. Lawrence power development project.

New "Coastal Finish" touch-up

"sprays" away transformer nicks—scratches

Nicks or scratches that occur in handling transformers can be easily and quickly sprayed away when you use the handy new Westinghouse "Coastal Finish" Touch Up. No messy brushes—no awkward buckets. Just press the button!

As you know, exclusive Westinghouse transformer "Coastal Finish" is the best laboratory and field tested answer to rust and corrosion—under any weather or atmospheric conditions.

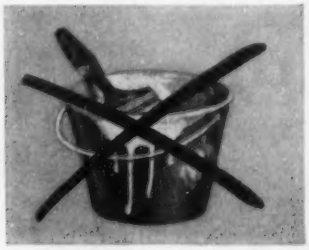
Now, the finish coat of the "Coastal Finish" system is available in handy 12-ounce pressurized cans for convenient application . . . anywhere. Full directions for use appear on the label.

For complete information on Westinghouse "Coastal Finish" Touch Up call your nearby Westinghouse representative. Or—if you prefer—write to Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. You will get prompt attention.

J-70716

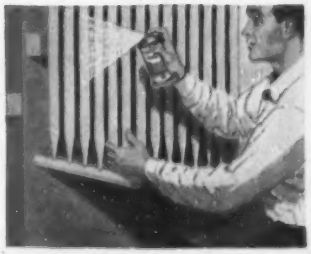
YOU CAN BE SURE...IF IT'S Westinghouse

USE "COASTAL FINISH" TOUCH-UP

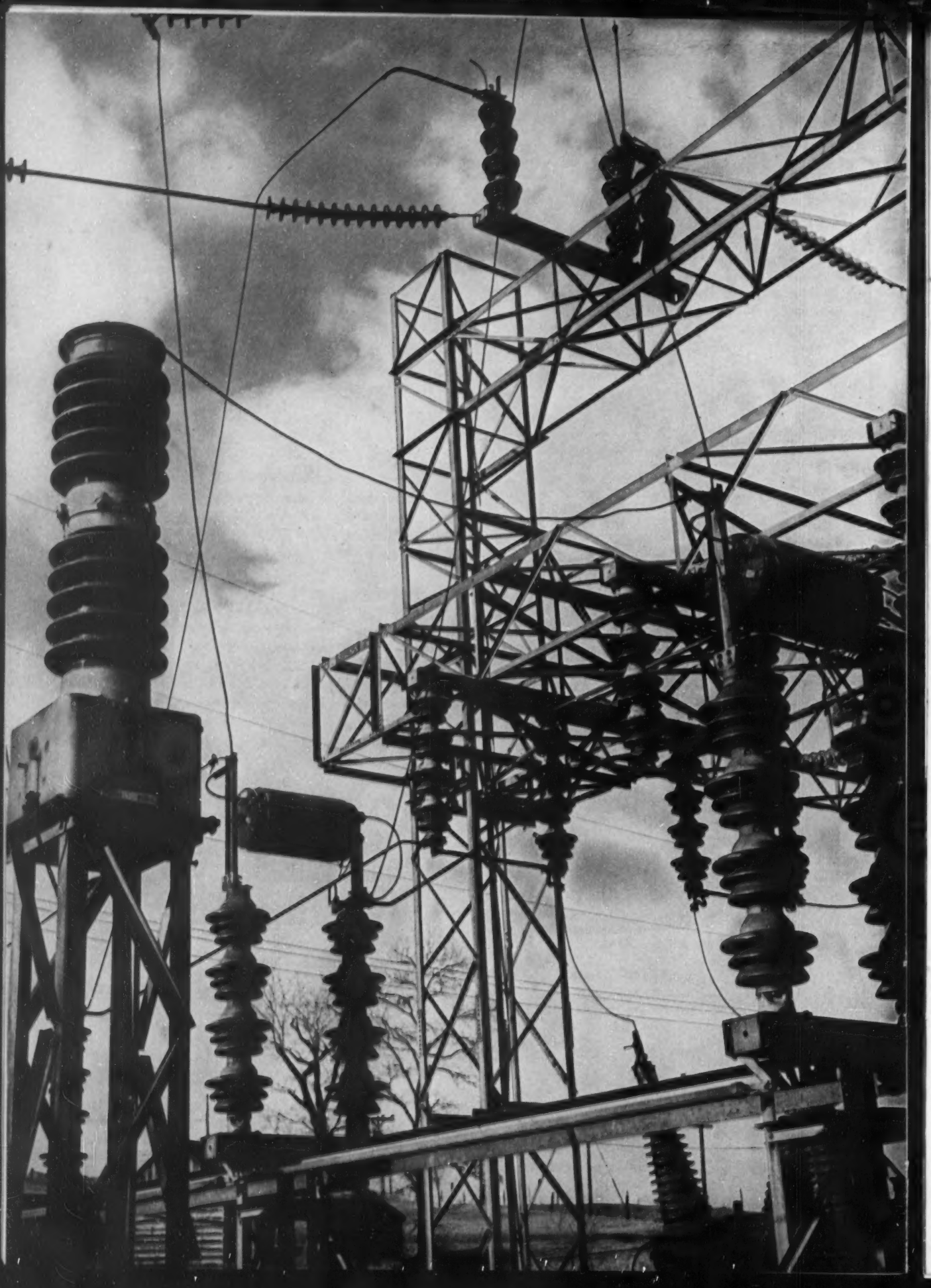


NO BRUSHES—NO BUCKETS

ON THE POLE



ON THE GROUND



Helping the industry meet its growing loads

Increasing Centralized Control with New, Improved Power Line Carrier

This Westinghouse coupling capacitor connects the power line carrier's high-frequency, low-voltage current directly to a 69,000-volt transmission line. An important link between the power system and its communication and control facilities, it makes possible such indispensable carrier functions as telemetering and supervisory control.

This means faster, more efficient dispatching of power. Why? Because (1) circuit loadings are continuously reported to the power dispatcher by telemetering, (2) supervisory control keeps him informed of breaker and other device positions, and (3) the power dispatcher has instant control of remote stations.

To make centralized control more flexible and to facilitate dispatching, Westinghouse developed the new Type FD power line carrier equipment. These electronic assemblies and coordinating equipment now provide many entirely new features for using available transmission facilities more efficiently. Telemetering and supervisory control are more useful than ever . . . carrier signals for protective relaying, automatic and manual remote circuit breaker tripping, teletypewriters, and voice communication have all been improved.

Some important features of this new carrier system will be found in the adjoining column. They are end products of more than 30 years of Westinghouse experience in the design and manufacture of power line carrier and associated equipment . . . and of an incessant, carefully organized search for practical answers to the operating problems of the electric utility industry. J-97178

YOU CAN BE SURE...IF IT'S Westinghouse

More services with new receivers

The increased use of carrier by the utility industry has created a need for more and more channels. Westinghouse Type FD carrier alleviates the resulting problems by allowing channels to be spaced more closely together. Chief reason for this channel economy is the unusually high selectivity of the Type FD receivers. More services result, not only from this but from the new, wide frequency spectrum range of 40 to 200 kilocycles.

Longer tube life with current regulators

Wide voltage variations, normally encountered with station batteries, cut the life of vacuum tubes. Westinghouse Type FD carrier provides, for the first time, regulators to stabilize heater current over the operating range and thereby neutralize adverse effects on vacuum tubes. These tubes operate at peak performance, longer — especially important in relaying assemblies where tubes must be ready for instant response of maximum effectiveness.

New swinging rack construction gives Westinghouse Type FD power line carrier greatly improved accessibility.

Station battery dependability for voice communications, too

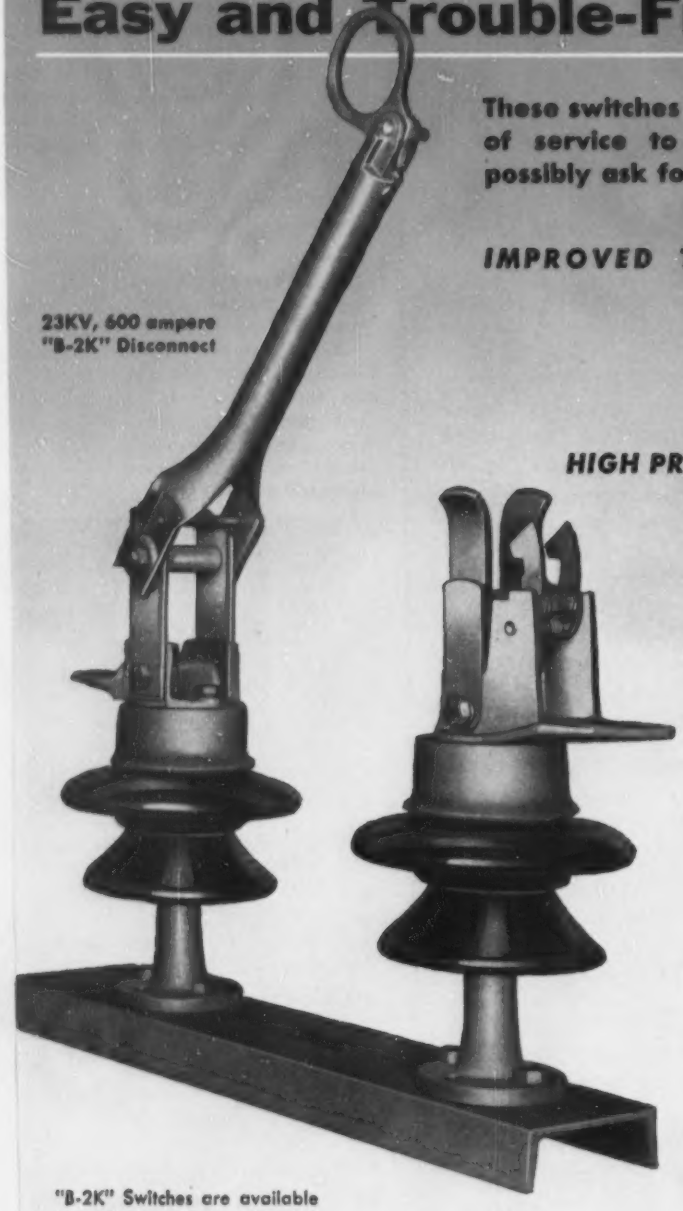
The new Type FD assemblies for all carrier functions including voice communication operate directly from 60 or 120-cell station batteries. Though a-c operation is also available, d-c operation is usually recommended. The brass-tacks reason: top dependability.

Narrow-band frequency shift units permit longer channels

The new limiter and discriminator circuits of Type FD frequency shift equipment now make longer carrier channels practical. Furthermore, operation even under unfavorable conditions is consistently good. The very narrow band width (only ±60 cycles) greatly increases the number of available channels yet accommodates high-speed functions such as frequency-type telemetering and teletypewriting better than ever before.

Use Delta-Star's B-2K
Outdoor Disconnect Switch for Easy and Trouble-Free Operation

These switches have been proved through years of service to provide everything you could possibly ask for in an outdoor disconnect.



23KV, 600 ampere "B-2K" Disconnect

IMPROVED THERMAL CHARACTERISTICS

Hard drawn copper contact shoes with ample material for heat dissipation. Hard drawn tubular copper blade constructed to avoid any possibility of contact misalignment.

HIGH PRESSURE LONG-LIVED CONTACTS

Contact shoes have heavy rolled silver inlays at points of contact which press firmly against copper blade. Pressure maintained by fatigue resistant beryllium copper alloy cantilever springs. Contact at hinge end made by blade operating against silvered hard drawn copper bars.

RIGID BLADE CONSTRUCTION

The hard drawn tubular copper blade is split and flared at the hinge end which gives it great transverse stability. No possibility of contact misalignment. A cast bronze insert is riveted inside the blade at the clip end to prevent distortion when slamming it closed.

IMPROVED BLADE PRYOUT

Operation is quick and easy in all types of weather with positive, effortless operating blade pryout and lock assembly, and large 3-inch hook ring. A slight pull on the hook ring is all that is necessary to break ice or corrosion accumulations.

"B-2K" Switches are available in single and double throw for upright and inverted mountings, in current ratings of 600 and 1200 amperes and in voltages up to 161KV.

WHEN YOU WANT THE BEST IN HIGH VOLTAGE SWITCHING EQUIPMENT SPECIFY DELTA-STAR

DELTA-STAR ELECTRIC DIVISION

H. K. PORTER COMPANY, INC.
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DISTRICT OFFICES IN PRINCIPAL CITIES

Ask for Publication 5104

NEWS ABOUT PEOPLE

WINTHROP E. MANGE

OTTO W. MANZ, JR

Con Edison Appoints 2 VP's

As vice presidents Mange and Manz will handle industrial relations, and testing-distribution work, respectively

Consolidated Edison Co of New York, Inc, has announced the election of Winthrop E. Mange and Otto W. Manz, Jr, as vice presidents. Mange will serve in industrial relations and Manz will be in charge of testing and distribution operations.

Mange was president of Staten Island Edison Corp when it was acquired by Con Edison in 1951. At that time he was appointed assistant vice president of Con Edison and has been specializing in the field of industrial relations in recent years. Mange, who graduated from Cornell University in 1922 with a degree in mechanical engineering, began his utility career that year with New York State Electric & Gas Co. After serving the Associated Gas & Electric System a number of years, he became vice president and general manager of Staten Island Edison in 1937 and was made president of that New York utility a year later.

Electrical Engineer . . . Manz, who has been an assistant vice president of Con Edison since 1952, was graduated from the University of Pennsylvania in 1923 with a B.S. degree in electrical engineering. Two years later he joined Brooklyn Edison, now a part of Consolidated Edison. He specialized in field test work until 1940 when he was assigned to the production department. He joined Con Edison's system operation department in 1946, becoming its manager in 1950.

•

Joseph J. Friedler, Jr, Southern district manager in New Orleans since 1930 for Ilg Electric Ventilating Co, Chicago, has been named vice president in charge of sales. Friedler joined the firm in 1925.

T. G. A. Sillers, assistant chief engineer of Allis-Chalmers Manufacturing Co's switchgear department, has been elevated to chief engineer of the department. Sillers, who will continue to make his headquarters at the firm's Hawley Works in West Allis, Wis., succeeds **L. J. Linde,** who was recently named director of electrical engineering for the General Machinery Division. **J. F. Chipman,** engineer-in-charge of circuit breaker design at the Boston Works, has been appointed assistant chief engineer of the switchgear department. He will continue to be located at the Boston Works.

Jack D. Stevens, chief of power resources of Bonneville Power Administration, has been employed by the Puget Sound Utilities Council, Seattle, to direct an engineering survey to explore construction prospects in the Puget Sound-Cascade area. Prior to his work with BPA, Stevens worked on surveys and construction of hydroelectric projects for Pacific Gas & Electric Co. He joined Bonneville in 1939.

W. A. Buchanan has been made manager of the newly opened Dallas, Tex., office of Ebasco Services, Inc, New York engineering and construction consulting firm. Buchanan, who has had broad experience in the utility field, has been associated with consulting engineering firms since 1947.

W. Harvey Thompson has been appointed assistant to the executive vice president of H. K. Porter Co, Inc, to replace **R. F. Allen,** who has been elected a vice president in charge of Porter's Buffalo Steel Division. Prior to joining Porter, Thompson was vice president of Standard Instrument Corp, New York.

EDWARD RUISCH

Ruisch Is Elected a VP of Iowa Public Service

Edward Ruisch, assistant to the president of Iowa Public Service Co, has been appointed a vice president.

A native of Alton, Iowa, Ruisch joined Iowa Public Service in 1920 after graduation from the engineering division of Iowa State College. He has served as a district manager, division manager, and for the past five years as assistant to the president. He was president of the Iowa Utilities Association in 1953.

Taylor Heads Wisconsin Group

HAROLD P. TAYLOR

Harold P. Taylor, vice president and treasurer of Wisconsin Public Service Corp, has been elected president of the Wisconsin Utilities Association. Taylor, formerly the association's vice president, succeeds George A. Donald, president and general manager of Lake Superior District Power Co.

The association also elected Carl J. Forsberg, vice president in charge of operations for Wisconsin Power & Light Co, as vice president to replace Taylor. Harold P. Chamberlin, assistant secretary and assistant treasurer of Wisconsin Electric Power Co, was re-elected treasurer.

The newly elected president is a native of Ashland, Wis. He was graduated from the University of Wisconsin's school of commerce in 1924, after which he worked one year in the accounting department of General Electric Co at Schenectady.

Taylor joined the Green Bay accounting department of Wisconsin Public Service in 1925, transferring five years later to the Milwaukee general offices as assistant treasurer. In 1938 he was made treasurer and promoted to his present post of vice president and treasurer in 1944. He was elected a director in 1952.

Burnham Named a Westinghouse VP

DONALD C. BURNHAM

Donald C. Burnham has joined Westinghouse Electric Corp as vice president in charge of manufacturing. Burnham, an authority on industrial manufacturing techniques, succeeds T. I. Phillips, who has retired after 39 years' service.

Burnham, who will make his headquarters in the firm's offices in Pittsburgh's Gateway Center, comes to Westinghouse from General Motors Corp, where he recently served as manufacturing manager and assistant chief engineer of the Oldsmobile Division.

Phillips joined Westinghouse in 1915. He was elected a vice president in 1941 and in 1952 was named to the president's staff in charge of manufacturing.

•

Harold Elliott has been promoted to sales manager of the High Voltage Division of Porcelain Products, Inc, Elliott, who will make his headquarters at Parkersburg, W. Va., replaces **F. E. Pope.** The new sales manager joined the High Voltage Division in 1950 as a field engineer.

Victor I. Corbell, vice president of the Salt River Project Agricultural Improvement & Power District, Phoenix, Ariz., has been elected president to succeed **W. W. Pickrell,** who has served in that capacity since May, 1951. **Bert M. Pringle,** a prominent construction man, was elected vice president. The Salt River Project comprises the Salt River Power District and Salt River Valley Water Users' Association.

Franklin J. Leerburger, consulting engineer, has resigned as chief engineering consultant to the New York State Power Authority, effective June 30, following reorganization of the authority. New full-time staff members are **J. Burch McMorran,** formerly of State Department of Public Works, chief engineer, and **Col William S. Chapin,** formerly of the New York Triborough Bridge and Tunnel Authority, general manager.

W. D. Baker, director of methods for Wisconsin Power & Light Co, has been elected assistant to the president to succeed **E. A. Barth,** who has retired. Baker has been affiliated with the utility industry for 39 years, all but six of them with Wisconsin Power & Light.

New AIF Directors

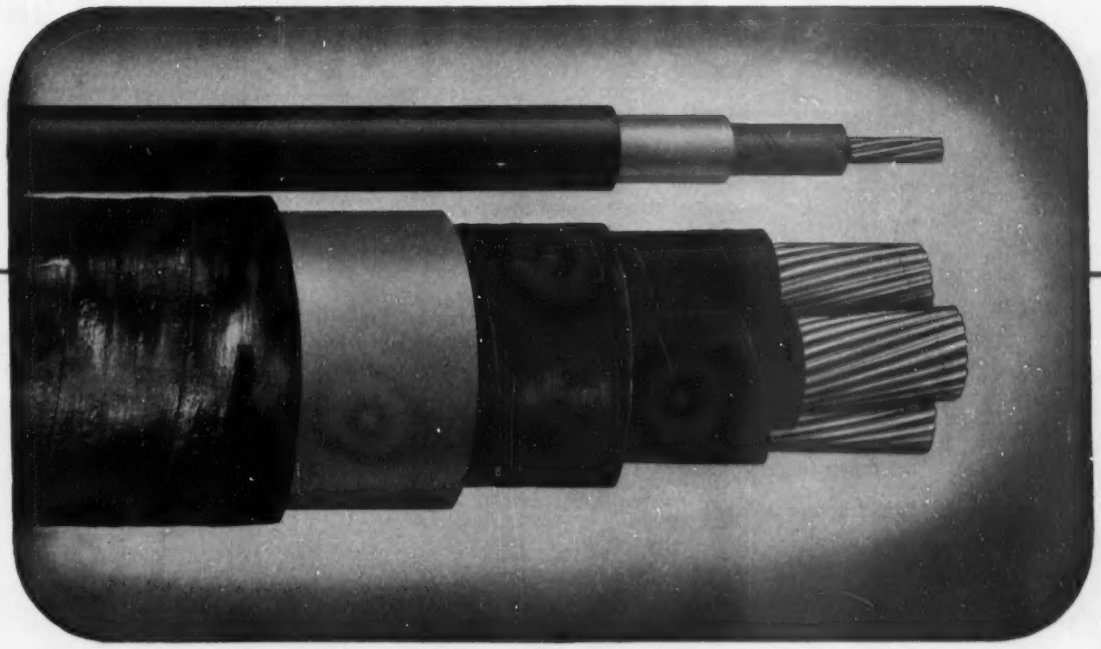
Five new directors have been elected to the Atomic Industrial Forum, New York. They are: Gordon Dean of Lehman Brothers, former chairman of the U. S. Atomic Energy Commission; A. C. Monteith, vice president, Westinghouse Electric Corp; Frank Pace, Jr, executive vice president, General Dynamics Corp; Arthur H. Bunker, president, Climax-Molybdenum Co; Leonard W. Cronkhite, president, Atomic Instrument Co; and J. Carlton Ward, Jr, president, Vitro Corp of America.

OBITUARY

Arthur H. Hemker, 47, manager of farm industries sales for General Electric Co, died May 22 while attending a class reunion at Kansas State College, Manhattan, Kan. Hemker, an electrical engineer, joined GE's Test Course in 1929. After doing rural electrification work for GE, he worked three years as a consulting engineer and five years as an industrial engineer for Central Illinois Public Service Co. He returned to GE in 1941, joining its Farm Industries Division when it was formed in 1945. Three years later he assumed the manager's post.

ROEBLING PROTECTIVE COVERINGS ON LEAD SHEATHED CABLE

for utilities, chemical plants and the petroleum industry



LEAD SHEATHED CABLES used in certain applications by public and private utilities, chemical plants and the petroleum industry are often impaired by electrolysis or chemical corrosion. But such corrosive action can be effectively reduced, and cable life extended, by using Roebling Paper Insulated and Varnished Cambric Cables with either of two outer protective coverings.

One of these coverings is an extruded thermoplastic sheath employing a special high-molecular weight polyethylene. The other is ROESHEATH, built up of neoprene and neoprene-filled fabric tapes and vulcanized directly over the lead sheath. Both coverings not only provide essential protection, but, in some cases, may permit the thickness of the lead sheath to be reduced.

For longer, more dependable cable life and worthwhile economy write for full information... and get our recommendations for solving any special problem.

John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

A subsidiary of The Colorado Fuel and Iron Corporation

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ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST & 5 PITTSBURGH ST • CHICAGO, 5525 S. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • PITTSBURGH, ROOM 329, HENRY W. OLIVER BUILDING • ROCHESTER, 1 FLINT ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • ST. LOUIS, 3001 DELMAR BLVD • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, N. J.

CF&I

1951 GENERAL ELECTRIC INTRODUCES SELF-X, A NEW FLAME-RETARDANT INSULATION

1954 SELF-X GUARDS OVER 10,000 GENERAL ELECTRIC METAL-CLAD UNITS

G-E METAL-CLAD SWITCHGEAR lineup features Self-X, G.E.'s service-proved flame-retardant insulation, at vital points.

COFFIN AWARD. Nicholas F. Arone, laboratory engineer in G-E Switchgear Product Laboratory, receives Company's highest employee honor—the coveted Coffin Award—from G. E. Burens, General Manager, Switchgear and Control Division, for developing Self-X insulation.

COMPARISON TEST shows why Self-X insulation gives better protection to metal-clad switchgear. In this photograph, taken immediately after both pieces of insulation were withdrawn from the flame, N. F. Arone (at right) holds a piece of ordinary insulation which continues to burn, while the Self-X held by H. F. Hentschel, General Manager—Medium Voltage Switchgear Department, stopped burning as soon as flame was removed. Other tests of Self-X included exposure to electric arc.

Self-X insulation proved by three years of service

Back in 1951, the first sheets of a new type of flame-retardant, self-extinguishing insulation, just developed by General Electric, were installed in a metal-clad switchgear unit.

In severe laboratory tests, the new Self-X insulation proved that it could stand up even under direct flame or an electric arc. As soon as direct flame contact was removed, polyvinylchlorides in the laminated sheets went to work *fast*. Smothering action started—and the fire was put out in less than a minute.

That was over three years ago. Today, this service-tested insulation developed by General Electric Company is acting as a built-in fire extinguisher for over 10,000 switchgear units. Its flame-retardant features make it ideal for bus and cable supports, insulating barriers, between compartments, box carriers for arc chutes—all vital spots.

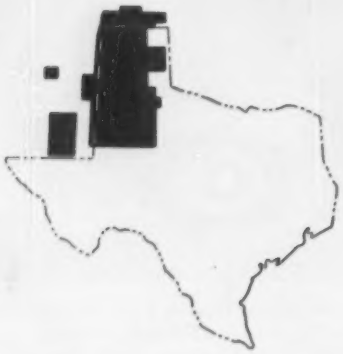
Self-extinguishing insulation is just one of the advanced safety features of G-E Metal-Clad Switchgear, which helps guard utility and industrial power distribution systems. To learn more about it, call your nearest G-E Apparatus Sales Office or Authorized Agent. Or write for bulletin GEA-5664 to General Electric Company, Schenectady 5, N. Y.

511-4

Progress is our most important product

GENERAL ELECTRIC

Southwestern PSC Planning to Double



But this projection is only part of the story of a utility that has increased its load 320% in the past 9 years and added facilities for increasing its generation by 359%. System capacity is expected to hit 1,000 Mw in next 5 years

Take 45,000 sq miles of territory in four states, add a diversified combination of industrial and agricultural loads, mix in an annual customer growth equal to or greater than 8.05% over the past ten years, and the description fits the area which is served by Southwestern Public Service Co, Amarillo, Texas.

Now in its 12th year as an independent operating company, Public Service has seen its system peak grow 320%, has increased system capability 359%, and served 365% more energy in 1953 than in 1944. And its customers will demand twice the 1953 peak of 462,600 kw in just five years, according to present estimates. Total system capability of 538,600 kw at time of peak in 1953 will be about doubled by 1958.

Growth Rate 19% Annually . . . Public Service has had an above-average rate of growth dating back to 1943. From that year to September, 1949, net peak load grew at the rate of 14.9% multiplied by 1.0335 annually. From then to September, 1953, the average annual increase was 19%. Present planning is based on an annual growth of 17.5% for the next five years.

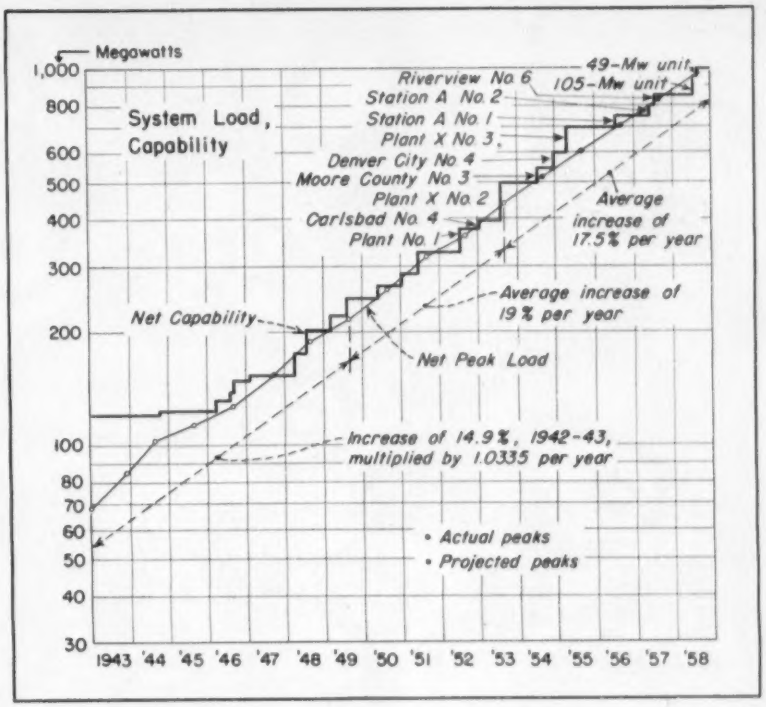
Additions to generating capability now underway to meet this demand will add 105,000 kw this year and 112,500 kw in 1955. An average of 81,300 kw will be added during each of the next three years to boost total system net capability to 1 million kw in 1958 to meet an estimated net peak of 970,000 kw. Energy sales in 1958 are expected to hit 4,316 million kwhr, compared with 1,930 million in 1953.

AREA served by Southwestern Public Service, with headquarters in Amarillo, Texas, includes industrial and agricultural activities spread over large portions of three Southwestern states

Public Service territory embraces the major portion of the Texas and Oklahoma Panhandles, a small area in southwestern Kansas and a larger area in southeastern New Mexico. Principal cities served by the company are Amarillo, Lubbock, Plainview, and Borger in Texas; Guymon in Oklahoma; and Clovis, Roswell, and Carlsbad in New Mexico. The headquarters town of Amarillo, with an estimated population of 106,000 is the largest city. Fourteen other cities in the area served have populations exceeding 5,000.

Load Diversity Is Good . . . Load in the territory is highly diversified, among both industrial and agricultural activities. The largest single type of

Load by '58



SYSTEM LOAD graph shows above-average growth since 1943. By 1949, net peak load had grown at rate of 14.9% times 1.0335 annually. Plans now are based on 17.5% annual growth

industrial load—petroleum products—is centered in the region around Borger, in the northern part of the system. Also in that area are carbon black plants producing about 45% of the country's supply, as well as large synthetic rubber plants and other industries allied with petro-chemical production.

Adding diversity by type and location are potash mines near Carlsbad that supply 85% of the world's demand. Other industries manufacture linen sheets, farm implements, school furniture, and military equipment. Cottonseed processing, livestock feed processing, flour mills, and cotton gins constitute an important segment of the company's load.

Long gone from the high plains area served by Public Service are the one-crop days. Over 3.5 million acres are under irrigation. From these fields and dry-farming areas come castor beans, cotton, potatoes, peanuts, row crops, sorghum, grains, lettuce, onions, sugar beets. Raising of beef cattle and sheep is a top ranching activity in the central part of the system. The company also provides the electrical energy requirements of 17 rural electric cooperatives in its operating area.

Plants Serve Local Areas . . . Growing out of this diversification and local concentration of load, as well as out of the extent of the integrated system itself, is the power supply philosophy of Public Service. The company believes in building local generation to meet the needs of areas about 50 miles in radius. Thus the system has 11 steam-electric stations about 100 miles apart. Interconnecting 115-kv transmission lines are looked upon mainly as higher-voltage distribution and emergency lines.

Present capabilities of ten of the plants range from 80,000 kw down to 6,000 kw for an average of about 37,000 kw per plant. In line with the policy of meeting local demand, four plants distribute 50% of their power directly at generator voltage. Two stations feed 25% of their output directly to the distribution system. The Clovis Plant distributes its entire output at generator voltage.

All plants burn natural gas as the primary fuel, and diesel oil is the standby at most stations. Diesel fuel was chosen in spite of its higher cost over Bunker C for two reasons—the need to burn oil is infrequent, and diesel fuel may be used immediately without preheating. The company owns 15 internal-combustion-engine plants with a total rated capacity of 13,778 kw. One 1,032-kw engine and an 80-kw hydro plant at Santa Rosa, N. M., serve that community which is not part of the company's interconnected system.

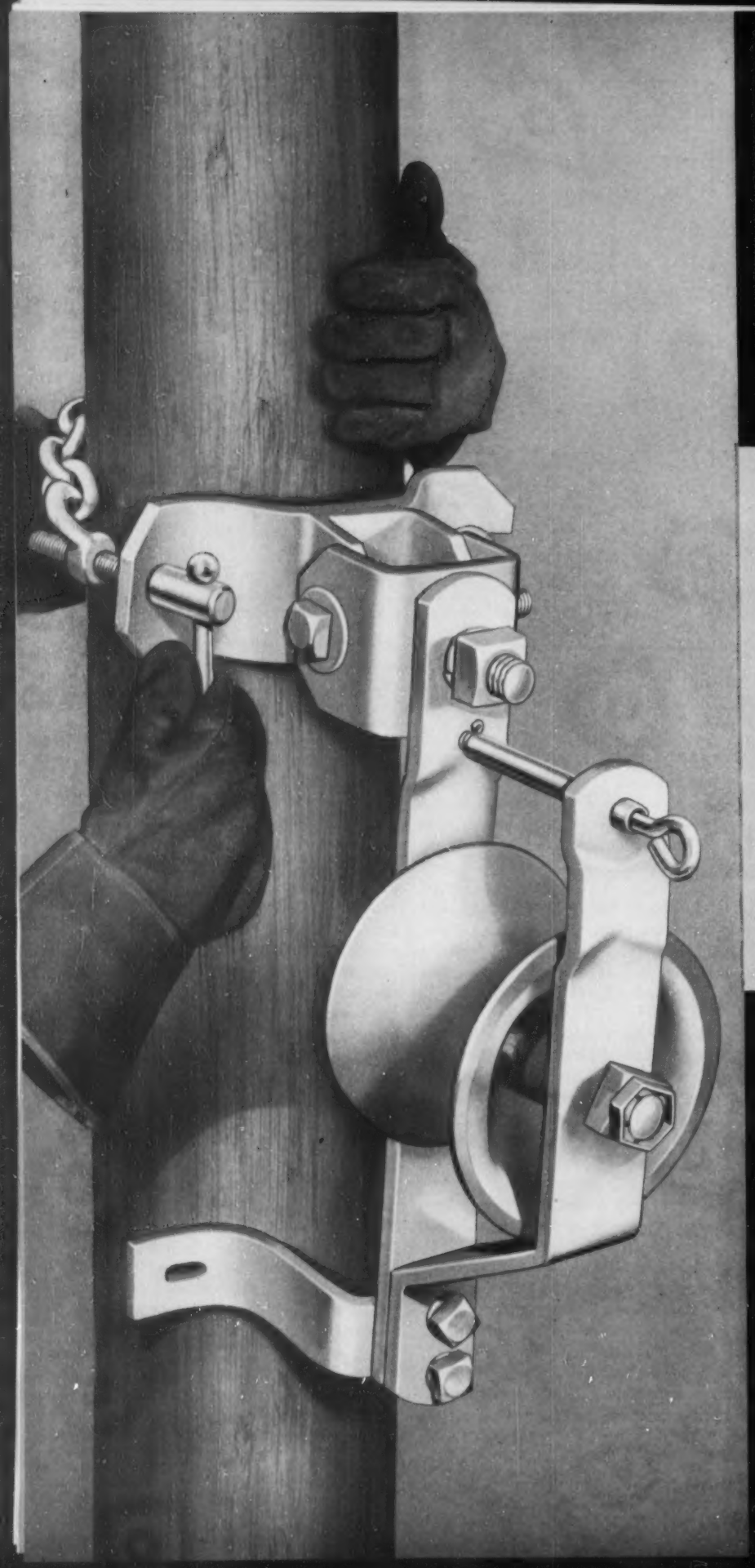
Plant X the Exception . . . The new Plant X feeds directly into the 115-kv system. This 165,000-kw plant is located at the electrical center of the system, near a 24-in. gas line. Surrounding terrain—sand hills, predominently—has a good rate of rainfall recharge of underground water to serve cooling towers and boiler make-up, and there is no competition from irrigation for use of the water. Plant X generally operates base-loaded to serve four generating areas.

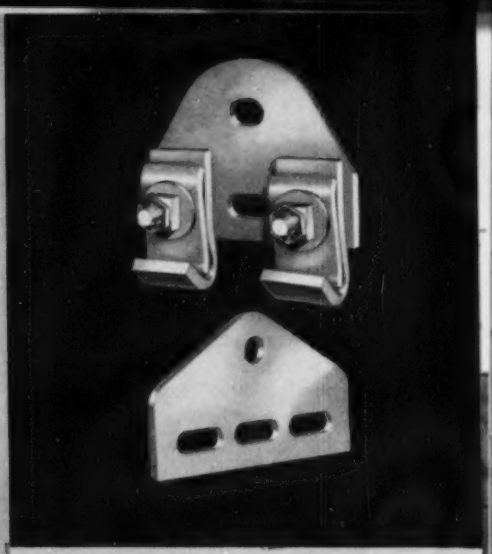
Plant X is the largest generating station on the Public Service system. Now installed are two units, one of 52,500-kw and the other of 112,500-kw capability. Under construction for operation early in 1955 is a 112,500-kw capability unit with 1,450 psi, 1,000/1,000-F steam provisions. This first reheat unit on the system is being installed because its better economy will help offset a possible rise in cost of natural gas fuel.

Ultimate capability of Plant X is 277,500 kw, which will be fed into the 115-kv system over five transmission circuits. The double-ring, figure-8 bus designed for the station offers increased operating flexibility and system protection. It requires only ten breakers to serve three 13.8-kv power transformers, one start-up transformer, and five 115-kv lines.

Modern and economical indoor plants with outdoor boilers, typified by Plant X which cost $102 per kw of installed capability, are required in the high plains region. Because the system peak is in the summer, all maintenance must be scheduled for winter. Prevailing north winds from the Plains States can drop the temperature to −16 F, although the normal winter low is −2 F. Windborne dust may make outdoor operation and maintenance of totally outdoor plants impracticable.

Company Does Designing . . . Plant X, as well as all recent plants, all lines, and major equipment on the system, was engineered by the com-

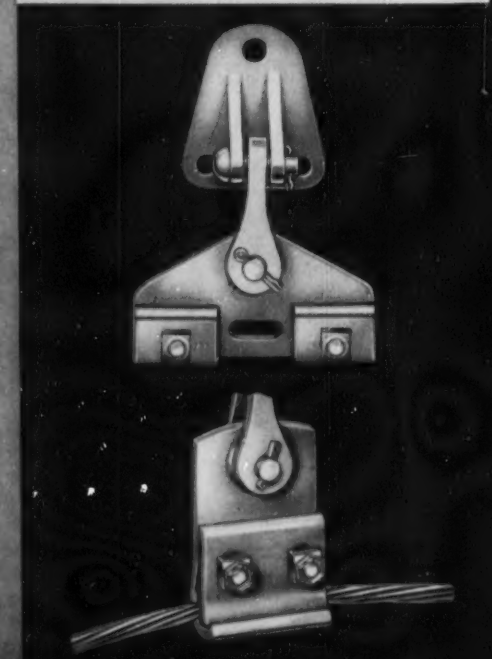


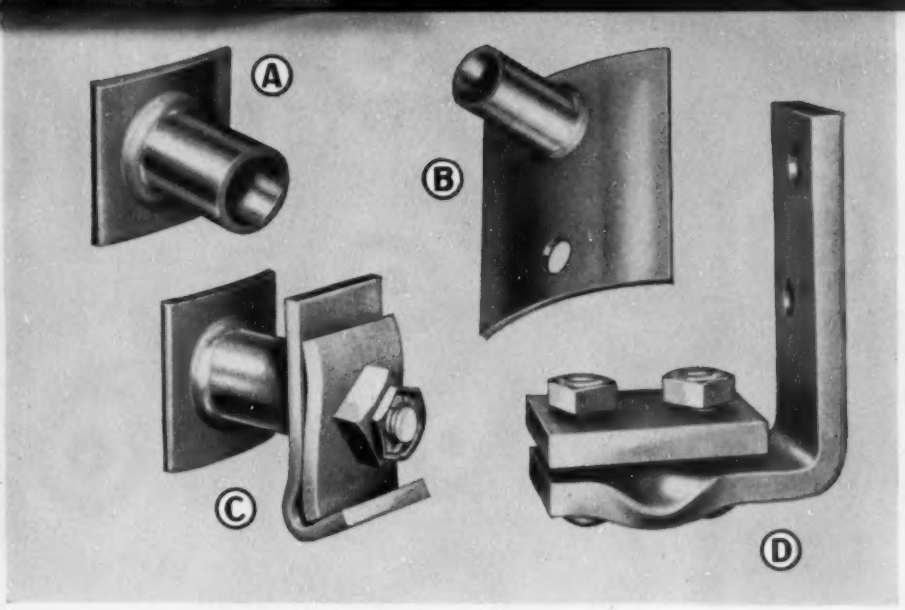


DOUBLE SUSPENSION HANGER clamps the messenger and may be used during stringing without tightening the clamps. The lower plate takes two or three one-bolt clamps. May be mounted as a unit with a machine bolt and washer spacer, or hung on the swinging bracket.

HINGED STRINGING PULLEY needed at each pole for economical, safe installation of aerial cable without damage to conductor insulation. Used on both tangents and angles, mounted just below the permanent messenger clamps, and removed after line is strung. Hinged joint between pulley yoke and pole frame permits pulley to swing out, keeping cable in the groove.

DOUBLE-SWING SUSPENSION BRACKETS made by combining standard parts. Below is the complete bracket; bottom illustration shows another type of hanger that may be substituted. Meets unusually severe conditions, where a free-floating bracket is needed. Assists in equalizing stresses on cable. Malleable pole plate is curved, to give extra rigid support; mounted with one machine bolt and two lag screws.

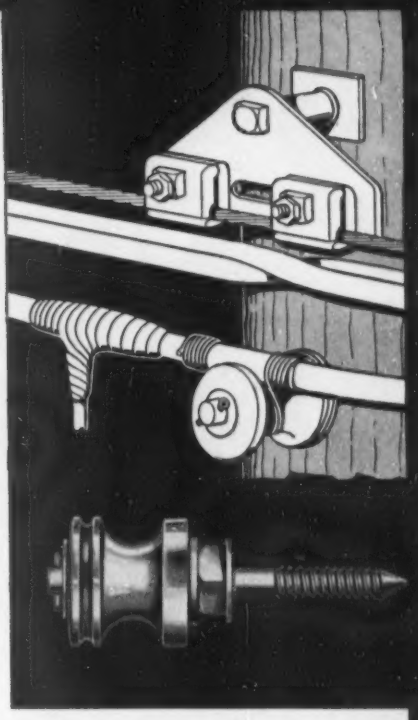




WASHER SPACERS used where standard machine bolts are used to mount messenger clamps. These spacers provide good bearing on the pole and keep cable from rubbing against the wood. Top left (A) is Flat Washer Spacer; at right (B) is Curved Plate Spacer for heavier cables, or longer spans; lag screw in lower hole keeps machine bolt from ovalizing hole in pole.

ONE-BOLT HANGER (C) shown with small washer spacer, used for small aerial cables such as street lighting and secondary cable. Rounded groove, flared edge. For ½" or ⅝" bolt.

UNIVERSAL MESSENGER HANGER (D) used for smaller size cable or where minimum clearance between cable and pole is required. Rounded groove has widely flared edges to prevent nicking the strand as well as to permit using this hanger on small angles as well as tangents. Forged open-hearth steel, hot-dip galvanized. Widths from pole 3⅜" and 4 3/16", and 4⅜" high, with offset holes for ⅝" machine bolt and ½" lag screw. Two ½" track bolts. For messenger from ¼" to 9/16".



INSULATED LAG SCREW BRACKET used to support the phase conductor where the conductor has been taken out of assembly—for example, when making a transformer tap. Standard ½" x 3" gimlet lag screw, with head and extension for a 3" dry or wet process spool insulator.

L-M Offers Service-Tested Materials to Simplify Aerial Cable Construction

DOUBLE UPSET EXTENSION BOLT provides, in one piece, a mounting bolt, spacer for pole clearance, and extension for mounting clamps. Eliminates stocking and assembly of separate parts, and thus saves more in time than it costs. Strong hexagonal section provides wrench hold. One-piece mild steel forging, ⅝" diameter, 6 to 18" long plus 4-inch extension.

To meet the special requirements of aerial power cable, Line Material some years ago began to study the needs for construction materials. The engineers, working alongside of the utility company specialists, soon found that standard pole line hardware was seldom completely satisfactory. And so a program of designing and testing special hardware was instituted. This program has continued, and as new requirements appear, new items are developed and tested.

L-M aerial cable construction materials are designed for maximum utility and interchangeability. These items can be fitted together in a variety of combinations to serve a number of purposes. The result is that with L-M aerial cable construction materials, you can solve almost any construction problem, regular or special, that may be encountered.

For help on any problem

Ask the L-M Field Engineer for information on the complete line of L-M aerial cable hardware, and a copy of Bulletin AC1; or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

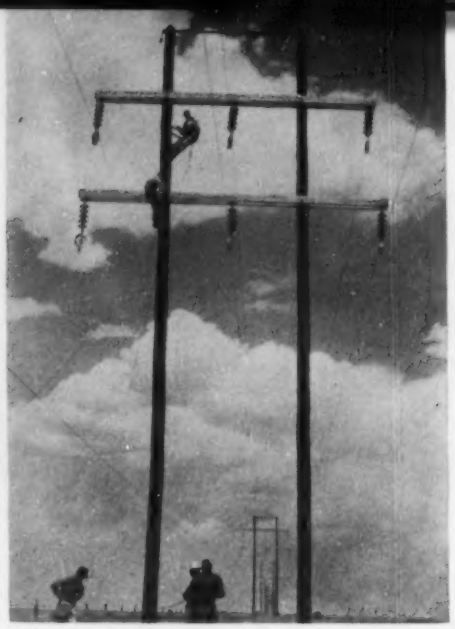
102

LINE MATERIAL

Line Construction Materials

Complete Coordinated Equipment for Distribution Today

GENERATION POLICY is based on modern, low-cost stations, like the Denver City, Texas, plant, which serve a 50-mile radius. Housing protects the units in winter



TRANSMISSION lines of 115 and 69 kv tying 11 major steam plants serves mainly as higher-voltage distribution net. Incremental loading practices lower costs here

pany's full-time design and engineering staff. The company feels a design group of its own provides these benefits:

1. Firm control over designs.
2. Design group keenly aware of the particular needs of entire system.
3. Young engineers under constant training and supervision available for promotions to planning and operating departments.

An example of how the design group coordinates its work with the sytem planning is found in Plant X. The three units for the station—52.5 and 112.5-Mw conventional units and the 112.5-Mw reheat unit—were selected with a view toward using them as prototypes for other plants on the system. Specifically, the 52.5-Mw capability unit will be added to the Moore County and Denver City Plants this year at a minimum of engineering cost.

Economical Generator Loading . . . The pioneering of new ideas for the system is not confined to the design department. In the spring of 1953, the operating department put into effect a method of most economical system loading. This is the first time the practice has been used in the Southwest. With 35 generators in 11 stations located across 45,000 sq miles and interconnected by a relatively small conductor, long transmission system, it was natural to apply recently developed theories to determine the most economical cost of delivered power.

Relatively large line losses could increase the cost of delivered power over local generation. Loading schedules for each plant on a most economical basis are designed to give equal incremental cost of received power for each plant, including the effect of transmission losses. Production of power is controlled from the Amarillo system dispatcher's office. Telemetering equipment brings in data for all line and plant loadings, both in watts and vars.

The transmission system now consists of 610 miles of 115-kv line and 1,325 miles of 69-kv. In general, the 115-kv system connects generating plants and step-down transformers in load centers and at points of direct delivery to customers. The 69-kv lines distribute power from transmission substations to local loads in metropolitan or heavy industrial areas. Present practice dictates the use of 397 MCM ACSR on most of the new 115-kv lines and 4/0 on the 69-kv circuits. Most of the older 115-kv conductors are 4/0 ACSR.

H-Frames and Static Wires . . . Wood-pole, H-frame structures are used generally for both 115-kv and 69-kv lines. Lines are single circuit for the most part with some underbuilding of 69 kv on higher voltage lines. Two overhead ground wires are used on each H-frame line because of the frequency of lightning. Static wires for both voltages are ⅜-in., extra-high-strength, 7-strand, galvanized steel. This wire was chosen because of its good sagging characteristics with respect to the standard ACSR conductor used. Heavy guying is required because heavy formations of ice occur.

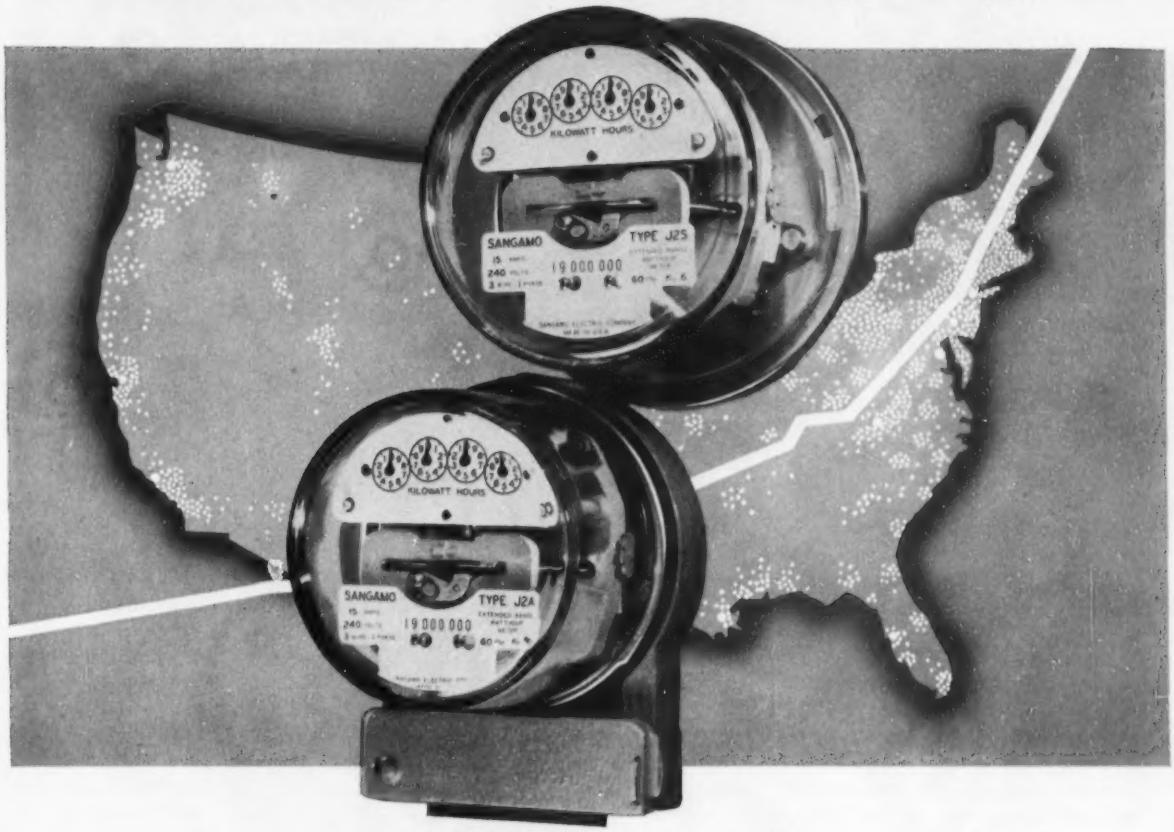
Public Service uses as standard design a galvanized angle-iron cross brace at the top of H-frames. This brace provides an excellent support for the ground wire, increases the shielding angle, permits a solid bond for the static wires and to the down-wire to ground, and makes the H-frame structure more rigid.

Looking to the future, the company has given thought to the establishment of a higher voltage—possibly 230-kv—as a backbone transmission system. A backbone system will be needed should conditions warrant the interchange of large power blocks.

Operating practice in the local areas has included the reinforcing of lower voltage lines with 115-kv and 69-kv circuits. In the southern part of the Texas Panhandle, 22 kv is used as a sub-transmission voltage, while 33 kv is used in the northern part. Thus some 1,400 circuit-miles of these voltages are in service, with about half the mileage representing 22-kv lines.

Breaker Ratings Reach 3,000 Mva . . . Switching practices have been evolved to meet system needs. Transmission line loadings of 10 to 20 Mw are about the average within the local generation area and 40 to 50 Mw loadings the average interchange power level. At present the 3,000-Mva breaker rating is the largest on

it's EVOLUTIONARY! it's NEW! the Sangamo Type J2



...to measure the Nation's growing power load

The nation's growing residential power load has led to a wiring capacity crisis that the electrical industry is meeting with a National Adequate Wiring program.

Adequate *measurement* of these heavier loads of the future will require a watthour meter with straight line accuracy up to 100 amperes—a meter capable of handling all foreseeable increases in average residential consumption. That's why Sangamo has developed the J2, a meter with reserve capacity to meet any contingency of future load growth.

The new Sangamo Type J2, with its extended range, will meet all requirements of accurate measurement for both today and the future.

The J2 is not a *revolutionary* new meter, but an *evolutionary* development from the time-proven Sangamo Type J. It retains many features that contributed to the proven electrical and mechanical stability of the Type J. Added improvements all contribute to better and longer performance over its extended operating range.

Get the facts . . . mail the coupon below for your copy of "Protect Your Investment in New Meters." It's just off the press, and gives the complete story of the evolution of the Sangamo Type J2 . . . the Meter with reserve capacity for growing loads.

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JM54-4

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Send my copy of "Protect Your Investment in New Meters"

NAME_____

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COMPANY_____

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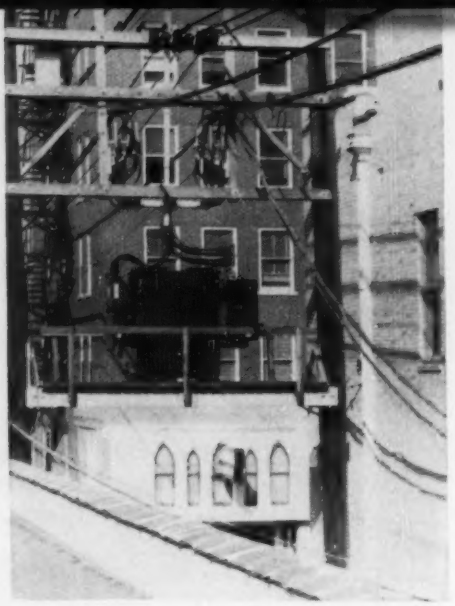
CITY and ZONE_____ STATE_____

COMMERCIAL LOAD has increased in Amarillo, and plans provide for such growth there and in Lubbock, Plainview, Bolger, Guymon and other larger municipalities



DISTRIBUTION in downtown Amarillo is 13.2-kv aerial cable feeding a 120/208-v network, as shown. For other areas and on new extensions 12.5-kv is the standard

the system. To eliminate larger breakers at new stations, the practice is to build a new 115-kv bus and tie it through station transformers to existing 69-kv or 13.8-kv buses. At Plant X and for all new breaker applications on the 115-kv system, 3,000-Mva breakers are specified. On 69-kv lines, 1,000-Mva units are being installed. The new 15-kv class breakers, rated at 1,000 Mva, connect new generating units to distribution buses for local area service. At locations in the field, 15-kv, 150 to 500-Mva units will be applied.

Distribution Voltage Standardized . . . Standard distribution voltage is 7.2/12.5 kv for both urban and rural circuits, except where 13.2-kv has been established. How fast lower voltages will be cut over will depend on present load and estimates of future growth. In some areas the cutting over is directly from 2.4 and 4.16 kv to 12.5 kv. New areas outlying established large town limits are served at 12.5 kv.

In other areas lines are being insulated for 12.5 kv but will be operated at 2.4 kv until growth in load requires a voltage changeover. Practically all rural distribution has been constructed for 12.5 kv and will remain at this voltage in the future. Public Service has 1,954 pole-miles of urban distribution lines between 2.4 and 12.5 kv. Rural distribution lines now total 4,535 pole-miles.

The one exception to the standard distribution voltage is the 13.2-kv system being expanded in Amarillo and also serving surrounding rural areas. Expansion was begun in 1949 by replacing the 4-kv open wire system in the downtown business district with an aerial cable 13.2-kv primary feeding a 120/208-v secondary network (EW, Sept. 10, 1951, p 126). The net work is expanded as the existing 4-kv system becomes overloaded. Completion of the program will depend on load growth. Aerial cable is also used on distribution primaries in other metropolitan areas where tree conditions warrant.

Some of the most important contributions to the design, construction and operation of the entire system have come from the company's standards committee. This group was formed in 1953 to further the system-wide adoption of standard practices. Through its efforts a standardized distribution design manual was prepared. Use of the manual has meant better lines at lower cost and with little or no rebuilding required as loads grow. Another contribution has been the standardization and elimination of certain materials. This has cut inventories considerably.

Aim for 90% PF on Peak . . . Var requirements for Public Service's widespread system are provided by generating units and capacitors on the distribution primaries. Practice is to install enough static capacitors to hold system power factor at 90% or better on peak. At present 186 kvar of capacitors are installed, about 43% of net peak kw. Standard sizes include banks of 300, 600, 900 and 1,200 kvar. For 2.4-kv distribution, down to 100 kvar per bank may be used. About half of the banks are unswitched, 40% are switched by time-control, and 10% by voltage-control.

Locations for new capacitor banks are determined by putting forecasted loads on an ac network analyzer. Var requirements of the transmission system will undoubtedly increase in the future because of heavier line loadings.

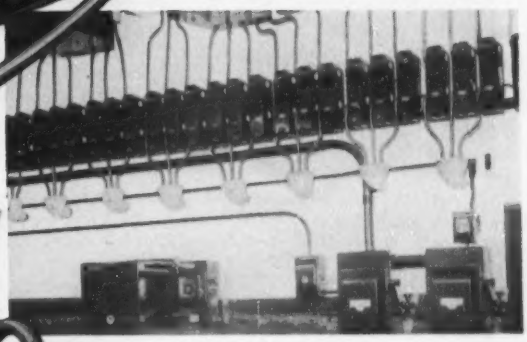
Sell Load to Meet Estimates . . . The system peak load curve for Southwestern Public Service does not show a bump and subsequent leveling off because of World War II. Nevertheless, the near-constant growth of demand has kept the planning and operating departments looking five years ahead to meet estimated demands. And equally busy with sales activities has been the utilization department.

Since 1949 the latter department has been meeting the competition of ample supplies of natural gas in order to turn future load estimate into realities. The residential and commercial sales force is the largest single group among the 44 employees in the utilization department. The company keeps in close touch with retail dealers through a utilization manager in each of the five divisions. Dealers have cooperated; so appliance sales have been high; for example, in the past three years over 6,000 electric ranges have been sold.

Here's a lot of switch in a small space

This Matthews Enclosed Disconnect Reduces Space Requirements

Switch may be swung toward pole with this swivel-type bracket that conforms to NEMA mounting arrangements.



Thirty #475 Matthews Disconnect Switches in a Minnesota power plant

Pry-out leverage makes switch easy to open with disconnect stick.

All Matthews Disconnects are given 31,000 to 45,000 volts high potential tests *after assembly* to detect any hidden weakness in porcelain.

DEAD-BLADE DESIGN... When blade is down, it is absolutely safe because all contacts are above the hinge... the blade is *dead*.

Utility companies who use the Matthews Disconnect Switch agree, there's a lot of switch packed into its space-saving, porcelain housing. They like its ruggedness, its high dielectric values, its *compactness*—only minimum space is needed for either cross arm or vault installations.

Available in 100 to 600 amperes, 5 KV and 7.5 KV ratings, Matthews Disconnects are especially easy to operate. When your lineman gives the pulling eye a yank with his hot stick, the pry-out blade helps him to break contact. A spring catch on the molded bakelite door keeps the door up and out of the way. Another spring catch holds the door securely shut to protect the switch in open or disconnect positions.

Tight, "non-freeze," point-type contact is guaranteed at all times by slotted clips. Yoke-type terminal lugs prevent spreading of terminal lead strands. And... the liberally designed Matthews Disconnect insures cool operation—there is exceptionally low heating at the full rated load.

You don't have to worry about radio or TV interference with a Matthews Disconnect either. There are no loose or isolated parts. Whatever the blade's position, cupped washers exert constant pressure on the blade where it is attached to the housing.

All Matthews Disconnect Switches can be furnished with plated terminal lugs for aluminum conductors at slight extra cost. Quick-break blades are available in the 200 and 400 ampere sizes.

If you want a disconnect that's easy to operate, rugged, yet *compact*, specify Matthews the next time you order.

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C554-16

STRIP HEATERS are demonstrated by C. F. Kreiser, Edwin L. Wiegand Co (center) to speakers and club chairman (l to r): W. C. Miller, Hartford Electric Light; A. D. Spillman, Philadelphia Electric; J. H. MacNeal, Con Edison (chairman); and W. C. Burgy, Caterpillar Tractor

Electric Heating for Industry . . .

. . . discussed at Interstate Power Club meeting. Hartford Electric Light presents survey on equipment used by its customers

Electric heating as a production tool for industry was the theme for the May 10th meeting of the Interstate Power Club held in New York.

Wesson C. Miller, Hartford Electric Light Co, reported on a survey of industrial heating equipment conducted by his company among its customers. Of 693 pieces of equipment surveyed, 58% were electric, 25% gas, 3% oil, and 14% steam. The survey has directed company sights toward a definite sales program for the future and proved a valuable selling aid, Miller declared.

C. F. Kreiser, Edwin L. Wiegand Co, said one small 500-w strip heater, operated 8 hours a day, uses more energy in one year than a complete electric range—and does it with less connected load and with less demand. Electric strip heaters produce $25 to $40 estimated annual revenue, he said. Metal sheath resistance heaters consume over 60% of the energy used for process electric heating by industry, and there are over 15,000 sizes, types and ratings available, Kreiser said.

Use of electric immersion heaters for three new 10-ton stereotype pots in a new newspaper plant showed a saving of $8,000 in equipment cost over a fuel-fired installation according to cost analysis figures by Philadelphia Electric Co, reported by Arnold D. Spillman. Additional space required for larger unit substation to carry electric melting load was only 10 sq ft compared with approximately 1,500 sq ft required for fuel premixing equipment, he said. Savings in metal dross and elimination of extra provisions to carry off products of combustion were also realized. Power consumption, as determined by actual test, was 15.2 w-hr per lb.

The trend in heat treating equipment is toward the electric type, stated W. C. Burgy, Caterpillar Tractor Co. This is largely because of the interruptable supply problems of natural gas, he said. The lower cost of gas is outweighed by the uncertainty of supply and the amount of stand-by equipment necessary to overcome the problems of curtailment, both partial and complete. Also ambient temperatures around gas furnaces are often as high as 135F whereas those around electric furnaces are generally comfortable.

Early Accord Not Likely on Ross Dam Extension

Seattle City Light should not expect an early agreement with British Columbia on the flooding of Canadian lands by the utility's Ross Dam on the Skagit River, Corporation Counsel A. C. Van Soelen has reported to Paul J. Raver, City Light superintendent.

Van Soelen reviewed for Raver a report from the International Joint Commission which met last month in Washington, D. C., to consider indemnity for the proposed flooding. The commission voted strictly along national lines, with the three Canadians outvoting the two Americans (appointment of a third American member is pending).

Seattle thought the matter was settled months ago, with British Columbia agreeing to payment of $255,508 by City Light. British Columbia authorities deny there was a complete meeting of minds, however, and refuse to execute a contract.

Under a 1942 order of the commission, based on a treaty, City Light could extend Ross Lake beyond the border when an agreement had been reached on the amount of damages. With British Columbia denying such an agreement, City Light will be unable to utilize storage capacity of Ross Dam to its fullest extent and downstream Skagit River plants will be unable to operate fully.

Solar Energy Scientists to Convene at '55 Parley

Leading world solar scientists and engineers are expected to attend the World Symposium on Applied Solar Energy which will be held next Jan. 12-15 at Phoenix, Ariz., under the leadership of Stanford Research Institute.

The parley will be under the general chairmanship of Lewis W. Douglas, former ambassador to Great Britain and chairman of the board of the Southern Arizona Bank & Trust Co.

Major U. S. centers of solar energy research will be represented and arrangements are being made for presentations by solar scientists and engineers from England, France, Germany, India, Japan, Australia, and South Africa.

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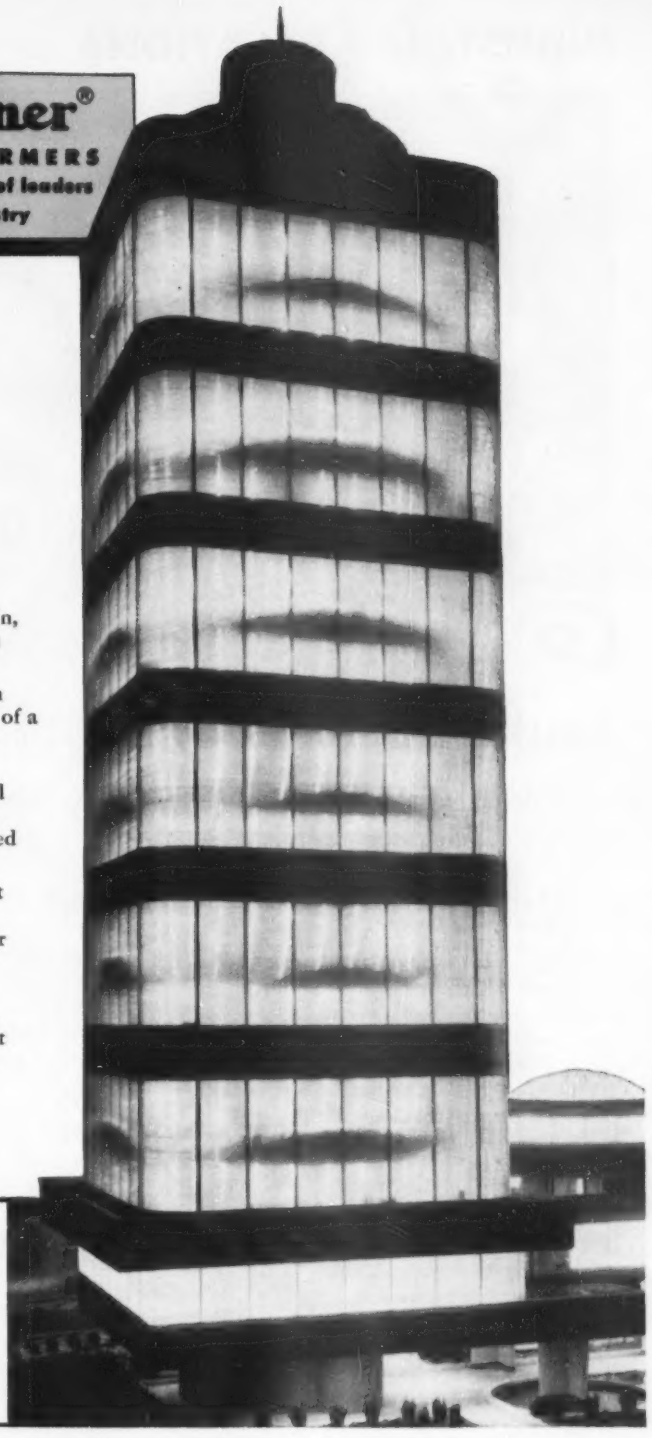
...the choice of leaders in industry



electricity helps plan for tomorrow

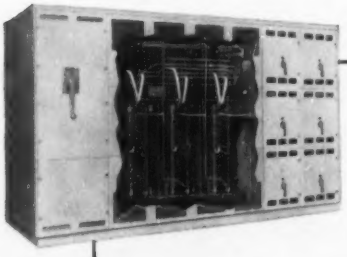
Research peers into tomorrow from this dramatic 156-foot "Helio-lab"—the Research and Development Tower of S. C. Johnson & Son, Inc., Racine, Wisconsin, world-famous manufacturer of wax products for the home, industry, and agriculture.

The Helio-lab is a versatile tool for research because it responds electrically—at the flick of a switch—to all demands for uncontaminated air, heat, light, lift, movement and control.

Power for the air conditioning, lighting and motor loads is supplied by a 750 kva and a 300 kva I-T-E Unit Substation, each equipped with Wagner Dry-Type Transformers.

Wagner Transformers are an important part of the equipment of many great industrial plants. In every case they are adding to their reputation for complete dependability . . . for unfailing service.

Let a skilled Wagner engineer discuss your transformer needs with you. Call the nearest of our 32 branch offices, or write us direct.



Metal-clad substation, equipped with a 750 kva Wagner dry-type transformer, at the Johnson "Helio-lab."

Wagner Electric Corporation
EST. 1891

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BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

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WT54-3

Southern Holds System Parley

Holding company stages operating forum for executives and 'young blood' to discuss problems, plans, and prospects

J. F. CRIST, vice president, The Southern Co, Birmingham, Ala.

Unique among utility gatherings was a two-day meeting held recently in Atlanta, Ga. There the men who make up the operating backbone of the Southern Co system of electric operating companies got together for a down-to-earth conclave on their problems, plans, and prospects.

Over 200 Present . . . Engineers, accountants, salesmen, and industrial relations men put on the show. The system-wide audience of more than 200 included directors of the operating companies and their senior executives as well as directors and officers of the Southern Co.

This operating forum, the first of its kind, was conceived by E. A. Yates, Southern board chairman, as a means of bringing the system's younger men into closer contact with the companies' directors and principal officers, and to enable the latter to observe these men in action.

There were two morning and two afternoon sessions. Each session included four 15-minute talks and a one-hour panel discussion.

The four panels discussed separately electric space heating, troubles experienced with major power plant equipment, economics in customer accounting and the development of employee relations. Each panel consisted of four member participants and a moderator.

Panel Moderators . . . Treatment of the subjects was lively and stimulating and interest was heightened by audience participation and by the airing of differences of opinion between panel members. Panel moderators were: George H. Brodnax, Atlanta Division vice president, Georgia Power Co; A. J. Watson, operating manager, Mississippi Power Co; R. P. Welsh, assistant treasurer, Gulf Power Co; and E. D. Long, assistant manager, labor relations, Alabama Power Co.

A list of subjects presented individually and the speakers follows:

"Cyclical Trends as a Factor in Forecasting Energy Sales," George B. Campbell, engineer, rate department, Southern Services, Inc.

"The Increasing Importance of the Rural Market and Ways to Develop It," M. B. Penn, chief agricultural engineer, Alabama Power.

"Development of a Productive Commercial Market," J. B. Browder, manager, commercial sales engineering division, Georgia Power.

"Fundamentals and Practical Aspects of Utility Rates," J. A. Zobel, rate advisor, Southern Services.

"Thirty Minutes in the Life of the Company," A. H. Wade, Jr. assistant operating manager, Georgia Power.

"Savings in Power Costs Through Integrated Operation," Grady L. Smith, engineer, power pool section, Southern Services.

"Successful District Operations," L. T. Hudgins, district manager, Alabama Power.

"Contract Crews vs Company Crews on Transmission Lines and Substation Work," J. E. Kizzire, land and construction engineer, Mississippi Power.

"The Purpose of a Plant Accounting Department," J. E. Erwin, plant accountant, Mississippi Power.

"The Use of IBM Machines and Electronic Calculators in Utility Accounting," A. H. Kern, supervisor of systems and methods, Alabama Power.

"Preparation of Cash Requirement Estimates," W. A. Conner, general accounting office manager, Gulf Power.

"Let's Don't Forget our Investors," Robert Wardle, Jr, assistant to vice president in charge of finance, Georgia Power.

"Key to Sound Community Relations," F. M. Turner, assistant to general manager, Mississippi Power.

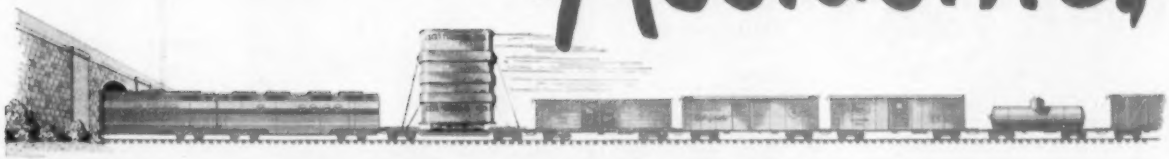
"Our Real Boss—The Customer," Ralph Merrill, district manager, Gulf Power.

"What Price Fringes?" H. L. Bowen, manager of industrial relations, Georgia Power.

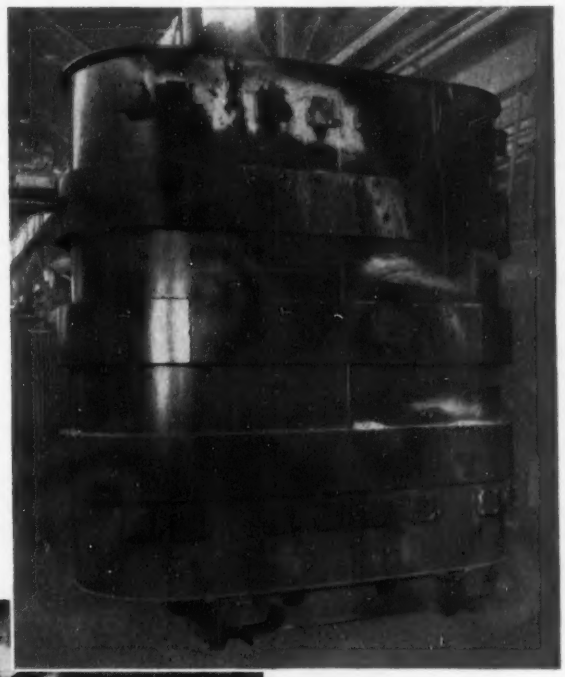
At the group dinner on the first night, the story of the background and development of the Southern system was presented by L. H. Jaeger, treasurer of Southern Co.

So enthusiastic was the audience reaction to this first forum that plans are being made for holding them once each year. At the conclusion of the sessions the group accepted by acclamation the invitation of Thomas W. Martin, board chairman of Alabama Power, to hold the second Southern Co Operating Forum in Birmingham in the spring of 1955.

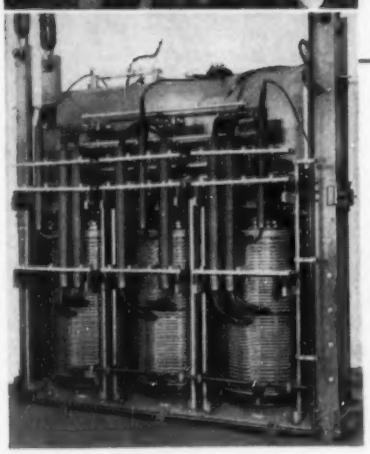
We don't like Accidents,



but, look what an accident showed us about our design



● Transformer tank withstood accident without damage.



● Inspecting engineer points out damaged base member.

● Electrical tests showed that no damage was done to the core and coils.

When the bridge is too low and the transformer traveling toward it is too tall, something is bound to happen when the two meet. And something did happen!

A depressed center car, carrying a Pennsylvania 7500 Kva Load Ratio Control Transformer, was switched from one track to another and coupled to the wrong train. Then it met up with the concrete bridge! After the dust cleared away, the transformer and car were found turned over on their sides.

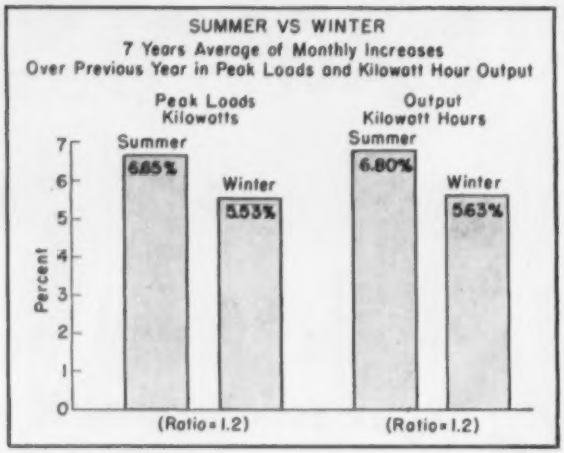
When returned to our shop, the transformer was thoroughly inspected. Electrical tests showed that no damage had been done to the core and coils. Damage inside the transformer was negligible — a broken bushing lead and a few cracks in some wooden supports. *That's all!* The internal damage was slight *because* the core-and-coil assembly was rigidly supported and held by the core clamping frames — even when the transformer fell over on its side.

Externally, the load ratio control compartment was distorted, but the controls were undamaged. Two mounting panels of the underload tap changing switch were cracked. The front of the switching compartment was distorted, as was the nitrogen cabinet. Some of the transformer base members were bent and cut, and the portion of the cover that hit the bridge was dented.

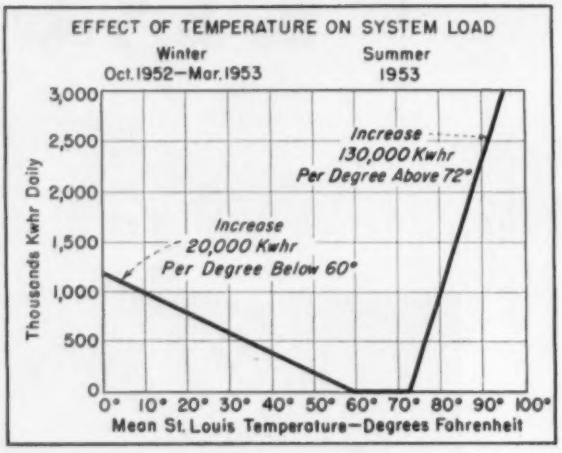
That was the sum total of the damage. Repairs were made and complete electrical tests showed the transformer to be in excellent operating condition. It was shipped back to its destination and this time it stayed on the right track.

We believe the negligible damage that resulted from this accident is substantial proof of the extra mechanical strength built into all Pennsylvania Power Transformers.

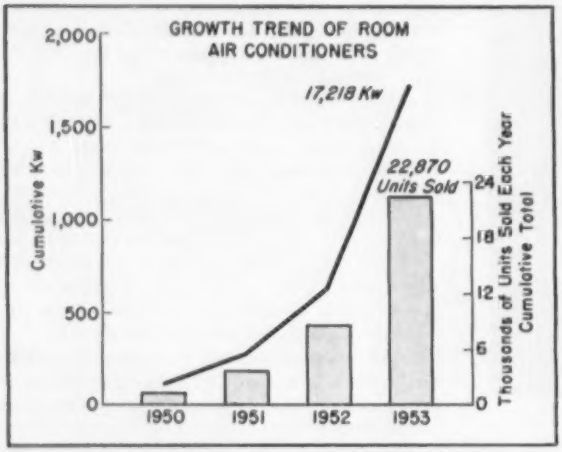
PENNSYLVANIA TRANSFORMER COMPANY
A McGraw Electric Company Division, **CANONSBURG, PENNSYLVANIA**
Greater Pittsburgh District



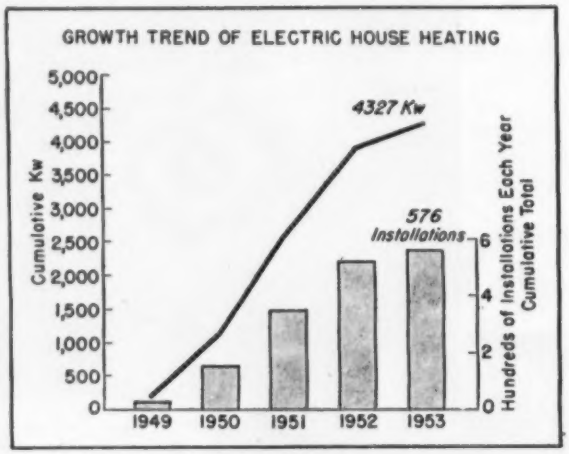
Both peak load and energy output are rising 20% faster in summer than in winter. The chart at right shows that temperature rise in



summer per degree above 72F increases daily energy output 6½ times as much as drop per degree below 60F does in winter



Principal contributor to faster growth of summer load is air conditioning, and electric house heating is a logical means to bring winter load



into balance. Relaxation of restrictions on use of competing natural gas caused the slow-up in growth of electric house heating in 1953

These graphs tell why Union Electric of Missouri . . .

. . . Promotes Electric House Heating

1953 system peak of the Union Electric Co of Missouri occurred on June 29. If the faster rise of summer load, as shown on the charts above, persists then a warm weather system peak is likely to persist also. This is a conclusion from the paper, "Hot and Cold," presented by M. E. Skinner, vice-president of Union Electric, at the recent national sales conference of the Edison Electric Institute.

And, said Mr. Skinner, a summer peak comes when high ambient temperature limits distribution lines and transformers to about 75% of their winter-time capacity. Generation and transmission facilities are similarly affected and steam generation capacity is further reduced by higher temperature of condensing water. This situation is aggravated by the fact that room air conditioners, a large contributor to growth of summer load, those now installed and being sold, have power factors ranging as low as 54%.

The heat pump is an ideal way to combine summer cooling and winter heating. Its growth and acceptance are inevitable. But as yet the heat pump is handicapped by cost and other considerations that limit its market rather closely. Pending the full flowering of the heat pump, lighting and space heating are the logical loads to be accelerated in compensation for the growing load of summer air conditioning.

Resistance heating for the entire

heating of residences and other buildings, taken by itself, is a winter load of almost all the undesirable characteristics of summer air cooling except that it has unity power factor and that it comes on when system facilities are capable of carrying most load, one third to one half more than in summer.

A survey of a large number of electric heating customers on the Union Electric system disclosed this interesting information:

"Are you satisfied with the heating performance?" Yes, 89%. No, 11%.

"Are you satisfied with the cost of operation?" Yes, 53%. No, 47%.

"Would you recommend electric heating to others?" Yes, 83%. No, 17%.

It is to be noted that the percentage of those who would recommend electric heating to others is much higher than the ratio of those satisfied with the cost of operation.

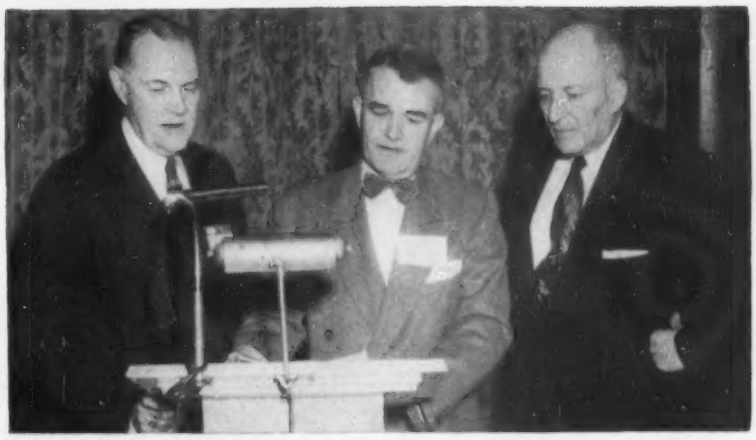
Of those dissatisfied with heating performance and with cost of operation, 67% did not have homes fully heat-insulated. And of those who would not recommend it to others, 77% did not have fully insulated homes.

Consideration of all the factors led to the decision to promote electric space heating for auxiliary and supplemental purposes and for complete space heating in fully insulated structures in all markets, residential, commercial and industrial.

First step taken by Union Electric in promotion of space heating was to compile a "Guide" booklet which tells how electricity is used for heating, what types of equipment are available and from whom, why and how structures should be insulated against heat loss, what electric heating will cost and what its advantages are over other heating means.

The booklet is being sent to all new home builders listed in Dodge Reports and is being personally delivered in calls by commercial and industrial representatives of the company. Newspaper advertising offering the booklet and tied in with the "Add-A-Room" theme was used in May. There will be more advertising in September when people begin to think about heating for next winter.

Under consideration is a budget billing plan to equalize space heating bills. If, and when adopted, this will add impetus to house heating promotion, make selling easier.



H. G. Blakeslee, Cory Corp, S. S. Cox, Detroit Edison and Walter Sormane of Hotpoint look over the program at the Commercial Electric Cooking Conference

Commercial Electric Cooking Calls for Aggressive Selling

The best interests of customers demand that utilities do some aggressive selling of commercial electric cooking equipment. Restaurants and food service establishments have stiff competition and must do all they can to save time and cut costs. This adds up to electrical equipment, Paul Penfield of Detroit Edison Co told the luncheon meeting of the annual Edison Electric Institute Commercial Cooking Conference in Chicago on May 11.

From the utility viewpoint, Penfield said, commercial electric cooking load is a good load. It has a good power factor, is largely off peak, does not require much investment to serve, and has a high load factor.

Detroit Edison has $4,000 worth of commercial electric cooking equipment which it puts out on a free trial basis, Penfield said. From 50% to 60% of it is out on trial all the time and 70% of the equipment put out on trial is sold.

Mrs. E. H. Steele, Director of Food Service, at the Club Inc, Birmingham, Ala described their all-electric kitchen, its advantages and the reasons for selection of all-electric equipment. These were:

1. To take advantage of the flexibility offered by electric cooking . . . no flues, pipes or chimneys.

2. To make full use of the automatic and accurate heat control of electric cooking which makes for consistent quality of food.

3. Working comfort of employees.

4. Durability and minimum maintenance.

5. Cleanliness which is possible with no combustion. Lowers kitchen maintenance cost.

Heat control, said Mrs. Steele, can make or break a budget and you never worry about that with electric equipment.

The EEI Commercial Cooking Committee's data sheet award for 1953, a check for $50, was presented to John Murphy of Duquesne Light Co.

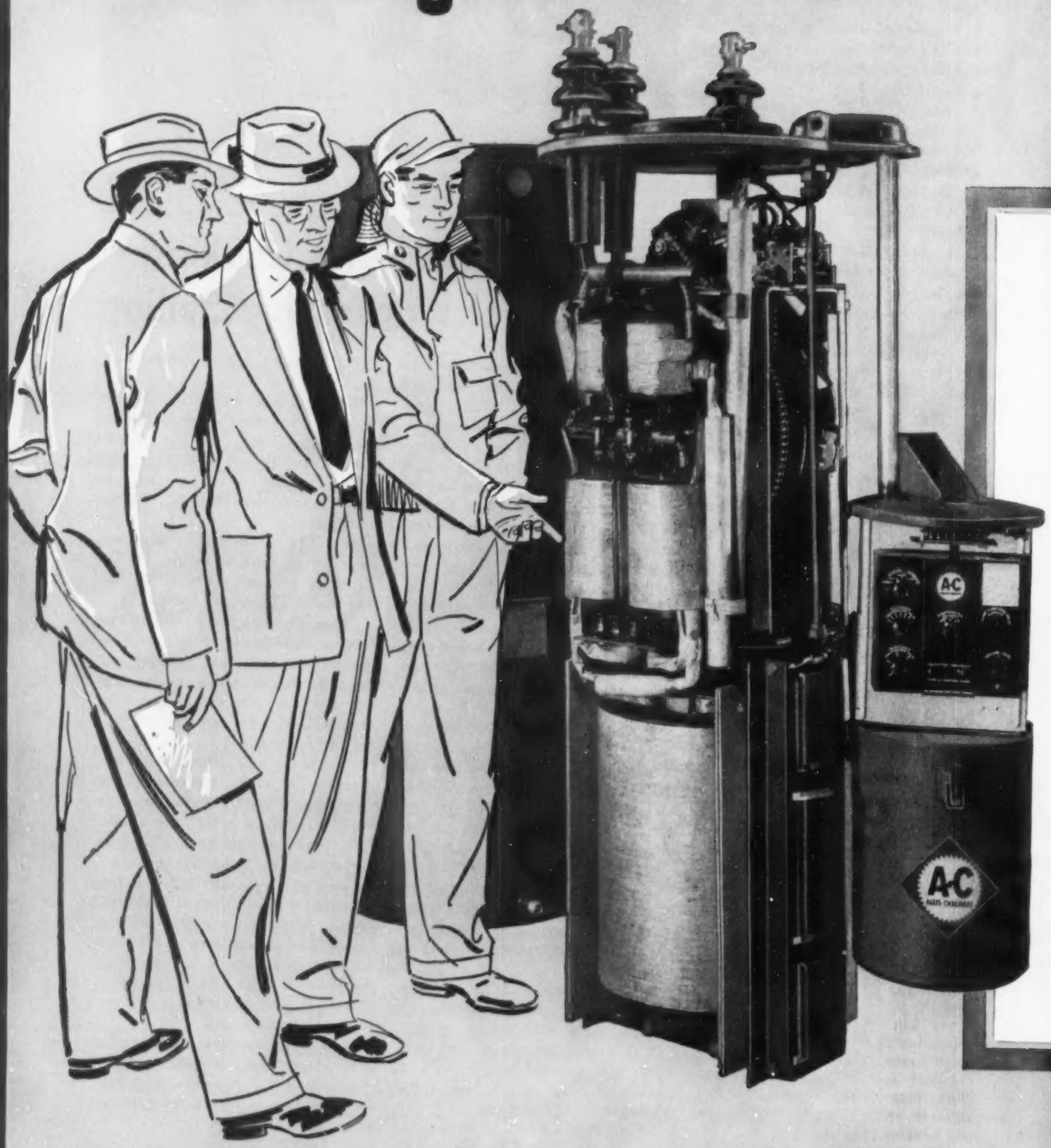
Hotpoint's new quintette commercial cooking unit that provides five cooking methods was demonstrated and described by Walter Sormane. The five methods are: surface cooking, deep well, fry kettle, griddle, and baking and roasting.

Experience with dehumidifiers was described by H. G. Blakeslee of the Cory Corp. They take the moisture out of walk-in refrigerated boxes, save food from spoiling when placed in dry storage by eliminating mold.

Hot water is the key foundation to sanitation in the food service industry, Charles E. Sperow of Ohio Edison Co told the conference. Booster water heaters provide hot water at the point of use. This is necessary, he said, if sanitation requirements are to be met economically.

G. S. Blakeslee of G. S. Blakeslee & Co showed a movie which pictured the restaurant as a food service factory and showed how it can be mechanized to save money.

Which Regulator is best?



ORIGINATORS OF 5/8% STEP REGULATION

this Utility compared them

ALLIS-CHALMERS 5/8% STEP VOLTAGE REGULATORS

A large eastern utility untanked and examined all three of the leading makes of voltage regulators. They called in engineers, purchasing people, operating and maintenance men . . . everybody who works on or with regulators. Designs were analyzed, construction checked, operation observed. Result: Allis-Chalmers distribution regulators came out on top.

After a comparison like this, no wonder this utility standardized on Allis-Chalmers distribution regulators. In fact, after more than 20 years of 5/8% step regulator experience, it's no wonder that Allis-Chalmers distribution regulators can meet every test both in the field and in the laboratory.

Now . . . you make the comparison!

You can examine an Allis-Chalmers distribution regulator completely free of charge. Allis-Chalmers will ship any recognized distribution system a Type JFR distribution regulator for thirty days of testing. Get complete information — or a test regulator — by calling your nearest A-C office. Or write Allis-Chalmers, Milwaukee 1, Wisconsin. Allis-Chalmers will also send you a copy of the new "regulator check list" to help you analyze all regulators.

Check these Advantages

***Quick-Break* Mechanism:** fast, efficient tap changing. Long wear made possible by "tool engineer's quality" and precision construction methods. Laboratory tests have proved this mechanism can withstand 5 million operations.

Long-Life Contacts: Large size, made of arc-resisting materials. Will they stand up? Utilities report over 10 years' operation with *no appreciable signs of wear.*

***Feather-Touch* Control:** You get a ± 1 volt band, Class I accuracy. Floating beam of regulating relay means friction can never upset accuracy because no mechanical bearings are needed.

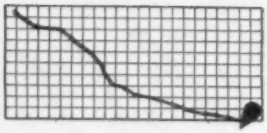
Unit Construction: Simplifies inspection. You can untank a unit simply by disconnecting the position indicator and removing a few cover bolts. Then hoist up on the cover-lifting eyes — complete unit comes up into plain view.

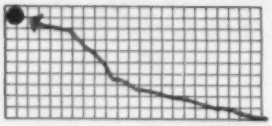
A-4257

ALLIS-CHALMERS

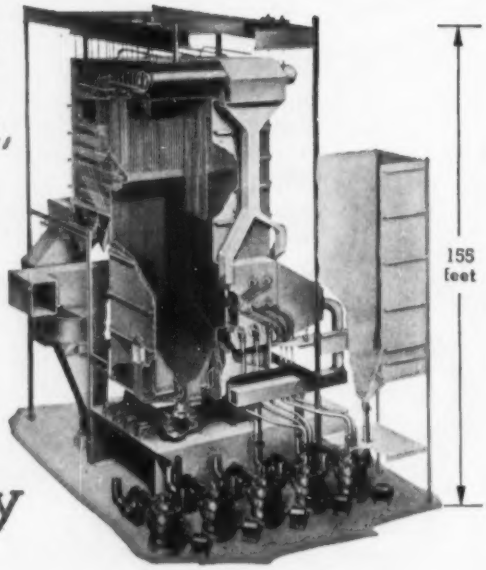
A-C ALLIS CHALMERS

YOUR POWER COSTS ARE WAY DOWN HERE



instead of way up here  because ever since **1881**, when Thomas A. Edison installed this B&W boiler in America's first central station on

in New York, B&W has committed men, machines and money to a fruitful, continuing search for better ways to make steam and get more energy from common fuels.



Today's power boiler stands <u>this</u> high. It stands <u>for</u> power progress and the pledge to keep research and engineering first --to produce even more steam power at lower cost.

BABCOCK & WILCOX
BOILER DIVISION
N-182

Hanna Nickel . . .

. . . signs for 65,000 kw to deliver 125-million lb of ferro-nickel to stockpile

Hanna Nickel Smelting Co, Inc, will obtain 65,000 kw of firm energy from the Columbia River federal system, according to two contracts recently signed. The power contract commits the last of the 120,000-kw reservation for defense production in the Pacific Northwest.

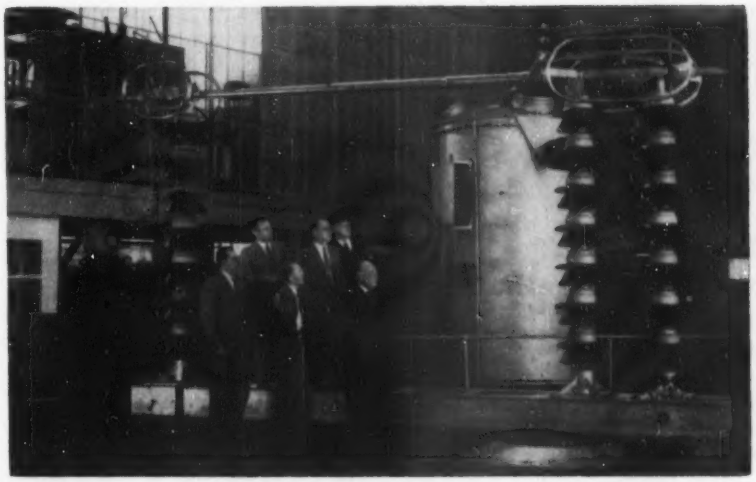
A 3-way agreement involves Hanna, Bonneville Power Administration, and the California Oregon Power Co. The contract applies BPA's standard Schedule C-4 power rate of $17.50 per kw-year for basic load, same as applied to aluminum smelting in the region. This development period rate applies for three months, based on daily demand at 2½ mills per kwhr, and another experimental operation period is allowed in the schedule.

The power will be used at Hanna's $25-million ferro-nickel mining and smelting development at Riddle, Ore. The Hanna operation, designed to tap the nation's only major source of ferro-nickel, has been stimulated by agreement of the Defense Materials Production Administration contract to purchase the product for stockpiling. The General Service Administration's agreement calls for Hanna to deliver up to 125-million lb of ferro-nickel.

Hanna hopes to have one furnace operating in July, a second by October 1, and all four before the end of 1955. Ore is mined by benching at Nickel Mountain, overlooking the Riddle plant site.

A Bonneville 150,000-kva substation at the plant and a 6 to 7-mile Copco 115-kv line to the substation is expected to be completed this month. Under BPA's agreement with the private power company, BPA will deliver 65,000 kw to Copco's Klamath Falls division over a recently completed 230-kv line between Redmond and Klamath Falls.

Secretary of the Interior Douglas McKay, in sending his congratulations on signing of the contracts, said it represents a "new landmark in the utilization of Pacific Northwest low grade ores. The plant at Riddle is the first ferro-nickel operation in the U. S."



330-kv Disconnecting Switch Tested

Acceptance test on a new 330-kv TTR disconnecting switch of the R&IE Equipment Division of the I-T-E Circuit Breaker Co, Greensburg, Pa., was witnessed by (left to right) R. L. Retallack, AG&E Service Corp, transmission engineer; Arem Foti, R&IE engineer; A. C. Bates, R&IE laboratory manager; E. A. Williams, R&IE chief engineer; I. W. Gross, AG&E Service Corp research engineer, and J. H. Kuhns, the New York representative of R&IE. The switch has a 1,600-amp continuous current rating and a 1,300-kv impulse withstand voltage. It is one pole of 34 3-pole switches to be installed at Clifty Creek Station of the Indiana Kentucky Electric Corp, which is a unit of the Ohio Valley Electric Corp.

B&W Ups Stainless Tube Output 40%

Tubular Products Division of Babcock & Wilcox Co, Beaver Falls, Pa., has completed an expansion program which will increase its productive capacity for stainless steel tubular products by 40%.

Statistics compiled by the American Iron and Steel Institute give production of stainless steel tubular products as shown in the table.

Year	Production, tons
1934	493
1940	7,104
1945	10,494
1950	12,094
1953	22,728

Demand for stainless steel tubular products has almost doubled since 1950. Advancements in atomic energy, aircraft, and boiler industries have increased the need for standard and special grades having unusual strength under high temperature and stress.

Regarding the trend to higher boiler pressures and temperatures, E. A. Livingstone, vice president in charge of the division, said that "our industry must anticipate such trends in order to keep pace with demand. Then, too, if the generation of electric power by nuclear energy is to become a commercial success, tubes must be available which can withstand the unusual conditions imposted."

British Engineering Group Gets Siam Electric Order

LONDON—(McGraw-Hill World News)—A contract valued at more than $3,640,000 (£1,300,000) has been awarded to the Brush Group of engineering companies for the supply of a wide range of diesel generating sets for the electrification of Siam's rural areas. Initial deliveries are already under way.

Mirrlees Bickerton and Day, Ltd, Stockport, Cheshire, and J. and H. McLaren Ltd of Leeds, Yorkshire,

will produce the 239 diesel engines required and manufacture the sets, and the electrical equipment will be provided by the Brush Electrical Engineering Co Ltd of Loughborough, Leicestershire, England.

The order was negotiated through the Brush Group agents, Loxley Rice (Bangkok) Ltd.

GE International People Meet in Mexico City

Mexico City—(McGraw-Hill World News)—Philip D. Reed, chairman of General Electric Co, and W. R. Herod, president of International General Electric Co, held a general meeting with representatives of GE from Cuba all the way down to Argentina.

W. H. Taylor, president of Mexican General Electric Co, said that since 1945, GE has invested six times its original capital outlay in Mexico. Three factories, at Cerro Gordo (Mexico City) and two in Monterrey, with branches in Guadalajara, Veracruz, and Puebla employ approximately 1,860 persons.

MANUFACTURING BRIEFS

Marcus Transformer Co, presently located at Hillside, N. J., purchased a new plant on an 18-acre tract in Rahway, N. J. A. Marcus, pres, announces that partial manufacturing will begin in Rahway sometime in June. Expanded facilities will allow increased production of the company's product, dry-type transformers. Employment will reach approximately 400.

Sales rights for heavy-duty brush cutter, brush hog, and a tailgate spreader manufactured by Hall Machine & Iron Works of Sedro Woolley, Wash., was given recently to Four Wheel Drive Auto Co, Clintonville, Wis. The brush cutter is built in three sizes—a truck mount, crawler tractor mount, and small tractor mount.

A new type power transistor, one of the first high-output transistors to become available commercially, will go into volume production shortly at Minneapolis-Honeywell Regulator Co's main factory in Minneapolis. The thimble-size unit was developed to operate such equipment as automatic controls. It has been used by the company in building the first transistorized fuel measuring system in the aircraft industry.

Minimum-Oil Breakers Going to SCL

Two minimum-oil, 3.5-million kva circuit breakers are shown being loaded for shipment to the new $2 million Shoreline substation of Seattle City Light. The new substation will serve increasing loads in the north Seattle area. Shoreline station is scheduled for completion this September.

The two breakers together with two more, will be the first of this type on the municipal system. They are 115-kv, 800-amp continuous current units, each using 175 gal of oil as compared with 2,300 gal for the conventional breaker. The breakers were built by Pacific Oerlikon Co, Tacoma, Wash.

MEETINGS CALENDAR

National Association of Electrical Distributors
Annual Convention, Atlantic City, N. J., June 6-11; Pacific Zone Convention, Mark Hopkins Hotel, San Francisco, Oct. 4-7.

***Public Information Program**
West North Central Region, Hotel Superior, Superior, Wis., June 11; East North Central Region, Dearborn Inn, Dearborn, Mich., June 25; Workshop Conference, Chase Park Plaza Hotel, St. Louis, Oct. 28-29.

***American Society for Testing Materials**
57th Annual Meeting, Hotels Sherman and Morrison, Chicago, June 13-18.

American Society of Engineering Education
62nd Annual Meeting, University of Illinois, Urbana, Ill., June 14-18.

Illuminating Engineering Society
Midwestern Regional Meeting, Hotel Jefferson, St. Louis, June 17-19; National Technical Conference, Chalfonte-Haddon Hall, Atlantic City, N. J., Sept. 12-16.

***University of Michigan**
International Mass Communications Conference on Nuclear Energy Developments, Ann Arbor, Mich., June 19-24.

American Society of Mechanical Engineers
Semi-Annual Meeting, William Penn Hotel, Pittsburgh, June 20-24; Fall Meeting, Schroeder Hotel, Milwaukee, Wis., Sept. 8-10.

Nuclear Engineering Conference
Sponsored by American Institute of Chemical Engineers, University of Michigan, Ann Arbor, Mich., June 20-26.

American Institute of Electrical Engineers
Summer General and Pacific General Meeting, Hotel Biltmore, Los Angeles, June 21-25; Committee on Petroleum, Conference on Electrical Applications in Petroleum Industry, Mayo Hotel, Tulsa, Okla., Sept. 27-29; Middle Eastern District Meeting, Abraham Lincoln Hotel, Reading, Pa., Oct. 5-7; Fall General Meeting, Morrison Hotel, Chicago, Oct. 11-15.

Canadian Electrical Association
Annual Convention, Murray Bay, Quebec, June 24-26.

Michigan Electrical Association
Annual Convention, Grand Hotel, Mackinac Island, Mich., June 27-30.

Edison Electric Institute
Accident Prevention Committee, Mark Hopkins Hotel, San Francisco, July 1-3; Industrial Relations Committee, Round-Table, Conference, Palmer House, Chicago, Sept. 27-29.

Northwest Electric Light & Power Association
Personnel Section with EEI Industrial Relations Committee, Multonah Hotel, Portland, Ore., July 12-14.

World Power Conference
Sectional Meeting, Rio de Janeiro, Brazil, July 25-Aug. 10.

Pan-American Federation of Engineering Societies
(UPADI), Third Convention, Sao Paulo, Brazil, Aug. 2-12.

Public Utilities Association of Virginia
36th Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., Sept. 16-18.

***National Electronics Conference**
10th Annual Conference, Hotel Sherman, Chicago, Oct. 4-6.

***Addition this week**

ON TEST MORE THAN 35 YEARS

Designs for this O-B Unit started back in 1915

This O-B Insulator, No. 32440, a 10-inch suspension in current production, embodies TIME-PROVED features in design and construction. Choose your insulators on the basis of known dependability. Choose O-B!

You get a product of PROVED dependability in every O-B suspension insulator. For example, these features were in use back in 1915:

1. Wet-process porcelain
2. A glaze in compression
3. Sanded surfaces between porcelain and cement for high-strength assemblies
4. Provision for thermal relief to accommodate expansion and contraction forces
5. Malleable iron cap castings
6. Application of galvanizing to withstand corrosion

All of the above have been subject to continuous refinement. Other features have been added. After a third of a century of experience, we feel we can lay claim to proficiency in insulator design *and* manufacture.

To you - the user - this experience and this proficiency mean only one thing:

Time-tested, trustworthy O-B insulators give you a bonus in quality - at a competitive price - unmatched in the insulator industry!

4497-H

Ohio Brass

MANSFIELD **OHIO, U.S.A.**

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

FINANCIAL

Summary of Accelerated Amortization Dispositions for Electric Utility Industry

Number of States with Orders Issued 27

Number of Orders Prescribing Restricted or Appropriated Surplus Method of Accounting 27

Number of Orders Prescribing Deferred Credit or Tax Reserve Method 11

State	Company	Date of Order	Accounting Disposition to Income	Accounting Disposition to Balance Sheet	Comments
California	Pacific Gas & Electric	5/17/54	Sub a/c of 507	Restricted Surplus	None
Colorado	Public Service Co of Colorado	12/15/53	Sub a/c of 507	Restricted Surplus	After completion of amortization Restricted Surplus is to be charged with 1/25th of amount in it and sub-account of 507 credited.
Illinois	Central Illinois Light Co	12/17/53	Sub a/c of 507	Tax Reserve	Petitioners request to use restricted surplus was denied.
	Union Electric Power Co	12/17/53	Sub a/c of 507	Tax Reserve	(Same as above)
Indiana	Southern Indiana Gas & Electric Co	3/16/54	Sub a/c of 507	Appropriated Surplus	The commission noted that this order is for accounting purposes only.
Massachusetts	Boston Edison Co	12/29/53	Sub a/c of 551	Tax Reserve	Account 551 is "Taxes Assignable to Electric Operations" under the Mass. Department of Public Utilities System of Accounts.
Missouri	Union Electric Co of Missouri	11/ 9/53	Sub a/c of 507	Tax Reserve	The commission stated that the balance in the reserve shall not be deducted from plant in arriving at the net rate base.
New Hampshire	Public Service Co of New Hampshire	4/ 8/53	Sub a/c of 507	Restricted Surplus	This order was in form of a letter to the company.
Oregon	Pacific Power & Light Co	12/23/53	A/c 539 (New a/c)	Restricted Surplus	Account 539—"Provision for Deferred Income Taxes Resulting from Accelerated Amortization" shall be set up following "net income before provision for deferred taxes."

Notes—In Federal Power Commission's Opinion #264 on Docket R-126, issued Dec. 4, 1953, which is for rate making purposes only, has in effect prescribed a method of normalizing taxes both during and after the period of accelerated amortization. On April 23, 1954, the FPC issued Order #171 which provided for accounting treatment for natural gas companies. This was based on the sub-account of 507 in the income statement and the tax reserve in the balance sheet. There is no information at the moment as to when a similar order will be issued for the electric utitilities under FPC's jurisdiction.

FINANCIAL BRIEFS

Duquesne Light Co will pay July 1 a quarterly common stock dividend of 43¢ a share to stock of record June 15 as compared with 40¢ previously.

Iowa Electric Light & Power Co has sold 120,000 shares of 4.30% cumulative $50 par value preferred stock privately through First Boston Corp and G. H. Walker & Co.

Massachusetts Supreme Court Judge J. J. Rowan sustains bi-monthly meter reading practice by the Boston Edison Co. An appeal to the full bench is under consideration, one alternative being a petition to the Department of Public Utilities for a public hearing.

Pacific Gas & Electric Co will sell one million shares of $25 par preferred stock. It is expected the issue will be offered to the public on June 23 . . . **New England Electric System** has received SEC approval to sell its subsidiary, Berkshire Gas Co to Pittsfield Coal Gas Co for $662,500.

La Salle, Ill., City Council has approved sale by a vote of 12-to-2 of the municipally owned street lighting system to Illinois Power Co for $40,000.

Gladstone, Mich., delayed plans for municipal plant when A. C. Allyn & Co, Chicago, was unable to sell a $2.1 million bond issue to finance construction of the generating plant. Practicability of the project had been questioned, the City Commission said.

Controlling interest of United Towns Electric Co, Ltd, has been purchased by a group of Newfoundland businessmen, together with Montreal, Canada, financial interests, including Power Corp of Canada.

SEC Exemption . . .

. . . for generating companies supplying power exclusively to parent owners is sought in proposed House bill

Legislation is now before Congress which would exempt utility owned generating companies from Holding Company Act regulation if they produce power excusively for transmission to their utility owners.

This exemption would apply directly to firms such as the newly formed Pacific Northwest Power Co (EW, April 26, p 15), a firm created by five Northwest private companies. As now written the measure would not apply to such generating companies as Electric Energy, Inc, and Ohio Valley Electric Corp, which will serve Atomic Energy Commission.

To date no hearings have been scheduled for the bill introduced by Charles A. Wolverton (R., N. J.), chairman of House Interstate and Foreign Commerce Committee.

SEC Regulation Defined . . . Under the bill a company would not be subject to SEC regulation solely by reason of its participation or ownership of a generating subsidiary. SEC would be authorized to bestow such exemption if the generating company met the following definition:

". . . Such companies is one which does not own or operate any facilities used for the distribution of electric energy for sale and which limits the facilities owned or operated by it to facilities used for generation of electric energy for sale and transmission facilities used in connection therewith; all of the outstanding voting securities of such company are owned by two or more electric utility companies owning or operating utility assets which are physically interconnected with the facilities of such company . . . all of the electric energy generated and sold by such company is sold to one or more of such electric utility companies owning the voting securities of such company; such company has no subsidiary company and is not a subsidiary company of a registered holding company; and, each of such electric utility companies owning voting securities of such company carries on its operations in one or more states having a state commission."

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE									
1954									
May 27	**2.89**	**2.96**	**3.17**	**4.07**	**4.17**	**4.46**	**4.72**	**5.10**	**5.50**
May 20	2.86	2.91	3.14	4.02	4.15	4.46	4.70	5.19	5.44
END OF QTR.									
1st 1954	2.82	2.87	3.14	3.88	4.09	4.42	4.83	5.19	5.42
4th 1953	3.07	3.12	3.34	4.17	4.32	4.62	5.07	5.57	5.51
3rd 1953	3.30	3.33	3.54	4.35	4.52	4.83	5.36	5.97	6.01
2nd 1953	3.34	3.46	3.64	4.47	4.70	4.88	5.52	5.93	6.10

Data: Reis & Chandler, Inc.

EARNINGS

Company	Period Months Ended		Net Income 1954	Net Income 1953	Earnings Per Common Share 1954	Earnings Per Common Share 1953
Gulf Power	12	April	$2,177,614	$1,886,420	$....	$....
Louisiana Power & Light	12	April	3,583,056	3,323,959	....	....
Michigan Gas & Electric	12	Mar.	465,051	492,797	2.79(a)	2.99(a)
Mississippi Power	12	April	2,209,781	2,123,661	....	....
Mississippi Power & Light	12	April	4,051,982	2,962,499	....	....
Montana-Dakota Utilities	12	Mar.(b)	2,591,789	1,668,186	....	....
Pennsylvania Power	12	April	2,515,182	2,241,768	....	....
City of Seattle Dept. of Lighting	12	Feb.	6,326,964	5,932,186	....	....
			1953	**1952**	**1953**	**1952**
Montana Dakota Utilities	12	Dec.(b)	$2,224,413	$1,864,289	$1.09	$ .97

Notes—The figures for the last company have been audited; (a) Based on shares outstanding at Mar. 31, 1954; (b) Combined net income.

FINANCING

Company and Description	Amount of Offering (000)	Offering Price	Yield to Public
WEEK OF MAY 27-JUNE 2			
Bonds			
Consumers Power—1st mtg due 1984	$25,000	(Temporarily postponed)	
Common Stock			
Connecticut Light & Power—590,290 sh (being offered common holders on a 1-for-10 basis, record June 1 to expire June 30)	$7,527	$12.75	6.90%
SCHEDULE FOR JUNE-JULY			
Bonds			**Bid Date**
Southwestern Gas & Electric—1st mtg due 1984	$10,000	.....	June 8
Salt River Project Agricultural & Improvement District, Ariz.—bonds due 1960-82	3,500	.....	June 8
Gulf States Utilities—1st mtg due 1984	24,000	.....	June 15
Jersey Central Power & Light—1st mtg due 1984	6,000	.....	June 15
Central Illinois Public Service—1st mtg due 1984	5,000	.....	June 15
Gulf Power—1st mtg due 1984	10,000	.....	June 22
Duquesne Light—1st mtg due 1984	16,000	.....	June 29
Consolidated Edison Co of N. Y.—1st mtg due 1984	50,000	.....	.....(f)
Boston Edison—1st mtg due 1984	18,000	.....	.....
Preferred Stock			
Central Maine Power—50,423 shs $100 par convertible (to be offered commonholders on the basis of 1-for-50 and the 6% preferred stockholders on a 1-for-10 basis, record about June 3 to expire June 14)	$5,042	.....	.....(e)
Gulf States Utilities—160,000 sh $100 par	16,000	.....	June 15
Duquesne Light—120,000 sh $50 par	6,000	.....	June 23
Public Service Co of New Hampshire—about 75,000 sh	7,500	.....	.....
California Electric Power—105,000 sh $50 par	5,250	.....	.....(b)
Connecticut Light & Power—200,000 sh $50 par	10,000	.....	June 17
Missouri Public Service—50,000 sh $100 par	5,000	.....	.....(a)
Southern Utah Power—3,224 sh 5% $100 par (1,224 shs to be exchanged for a like amount of 4½% now outstanding and balance of 2,000 sh to be sold privately)	322	.....	.....
Southern Nevada Power—250,000 shs (company will sell 50,000 shs and balance of 200,000 will be acquired by the underwriters from certain selling stockholders)	.....	.....	.....(c)
Common Stock			
Hilo Electric Light—25,000 sh (to be offered commonholders on 1-for-4 basis, record June 5)	$500	$20.00	8.00%
Philadelphia Electric—944,952 shs (to be offered commonholders on 1-for-12 basis, record June 7, to expire June 28)	.....	.....	.....
Long Island Lighting—690,620 sh (to be offered commonholders on 1-for-8 basis unsubscribed shs to be sold to underwriters; 64,685 sh to be offered to employees)	.....	.....	.....
Southern Utah Power—13,135 sh (to be offered commonholders on a 1-for-6 basis)	.....	.....	.....

Notes—(a) Postponed indefinitely; Kidder, Peabody & Co, underwriters; (b) Temporarily postponed; Merrill Lynch, Pierce, Fenner & Beane, group, underwriters; (c) William R. Staats & Co group, underwriters; (e) Harriman Ripley & Co, First Boston Corp, and Coffin & Burr group, underwriters; and (f) Temporarily postponed.

FPC's Panhandle Decision . . .

. . . makes history as commission realizes value of production properties and rate treatment of accelerated amortization

The Federal Power Commission's opinion of April 15 in Panhandle Eastern Pipe Line Co's rate increase has made history in that the FPC faced economic facts of life on the issues of value of the company's production properties and in rate treatment of accelerated amortization.

While the decision with respect to the rate of return was disappointing when the FPC found a rate of 5¾% based substantially on the cost of money approach as well as arriving at an unrealistic amount for working capital by the use of federal income tax accruals, it is believed that, on balance, the favorable issues may have far reaching implications to all utilities subject to FPC's jurisdiction.

Original Cost Theory . . . While the commission has always been, and still is, a strict adherent to the original cost theory with regard to the rate base, the element of value was allowed in cost of service by permitting Panhandle to charge "fair field price" of gas for supplies from its own wells.

While the contention of the FPC staff was that the only costs which the company should be allowed were those actually incurred by Panhandle; namely, .85¢ per Mcf the commission overruled the staff by allowing the company approximately 8¢ per Mcf, an amount approaching the "fair field prices" paid at arms-length to independent producers.

The FPC, in its opinion, stated: "In arguing strenuously that we should follow its rate-base approach in pricing the gas which Panhandle produces, the staff gives but scant attention to the economic aspects of the question or to the long run economic consequences of the course which it advocates. Rather, it seems to stand primarily on the fact that this has been the commission's long-established policy, which has been sanctioned by the courts, including the Supreme Court of the United States. That such has been the commission's practice is not disputed, although it may be pointed out that here for the first time we have before us in a rate case a complete record which fully sets forth the results of the two methods of gas pricing now at issue. To urge this as an adequate reason to continue the practice in the face of what is to us a convincing showing that it should be abandoned, however, approaches the contention that the doctrines of stare decisis or res adjudicata have application in the field of administrative ratemaking. But this is far from being the case."

The FPC said, "No policy which, immediately leading to somewhat lower rates, fails to create an atmosphere favorable to the exploration for natural gas by pipeline systems and the minimization of its flaring in production or waste in its utilization promotes the sound conservation of this irreplaceable natural resource, which is in the long-run interest of the nation."

Conclusion . . . The commission concluded: "For all the foregoing reasons, we have concluded that, as a matter of sound public policy, we should re-examine at this time the treatment which the commission has heretofore accorded pipeline-produced gas in ratemaking. We are convinced, from our analysis of all the facts of record, that the ultimate public interest will be better served by permitting the pipeline to receive for the gas which it produces a price reflecting the weighted average arm's-length payments for identical natural gas in the fields (and sometimes from the very same wells) where it is produced than through the application of the 'rate-base' method to this commodity. We find that the uncontradicted evidence introduced by Panhandle in this proceeding represents a reasonable basis for such pricing."

With regard to accelerated amortization, the commission, in acceding to Panhandle's contention that the tax deferral should be normalized, said, "We do not regard Section 124A of the Internal Revenue Code as authorizing us to reduce the rates of Panhandle by whatever temporary tax savings it has secured or may secure pursuant to that section, because Congress offered those tax savings as an inducement for an investment in properties which were regarded as essential for national defense purposes. Any inducement to invest in those facilities would be entirely lacking if the tax savings were passed on directly to the customers of a company operating certified facilities."

Section 124A . . . The FPC continued: "It is equally clear that Congress did not intend by Section 124A to provide a fund which could be diverted by Panhandle to the payments of dividends to its shareholders. Since the possession of a certificate of necessity is essentially a deferment of tax liability, the accruals for taxes in excess of those actually paid should logically be treated by Panhandle, not as free and unrestricted income, but earmarked to provide for the future meeting of such liability.

"As we previously pointed out in Opinion No. 264, the customers of Panhandle will not be called upon by reason of the accelerated amortization provision to do anything different than what they would be called upon to do without that provision. They will pay the same rates; no more, no less. They neither lend nor give their money to Panhandle. It is the other two parties to the transaction who change their position—the United States Government and Panhandle. The United States Treasury will not receive, in the five-year period, money which it otherwise would have received, and Panhandle will have the money which Congress does not require it to pay to the Treasury during that period. Thereafter, Panhandle must start paying money back to the Treasury. No contribution is made by customers."

State regulatory commissions may well ponder the above decision, especially in the light of Justice Felix Frankfurter, (mentioned in the opinion) when he was speaking for the Supreme Court in another case, when he said, "The process of rate making is essentially empiric. The stuff of the process is fluid and changing—the resultant of factors which must be valued as well as weighted."

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Designed in cooperation with the tube manufacturer, the assembly consists of a special non-inductive resistor mounted within a Lapp porcelain cylinder. End caps, bolted to flanges cemented to the porcelain, seal the ends of the porcelain. They also carry load current to the resistor, and provide for water connection for cooling the resistor.

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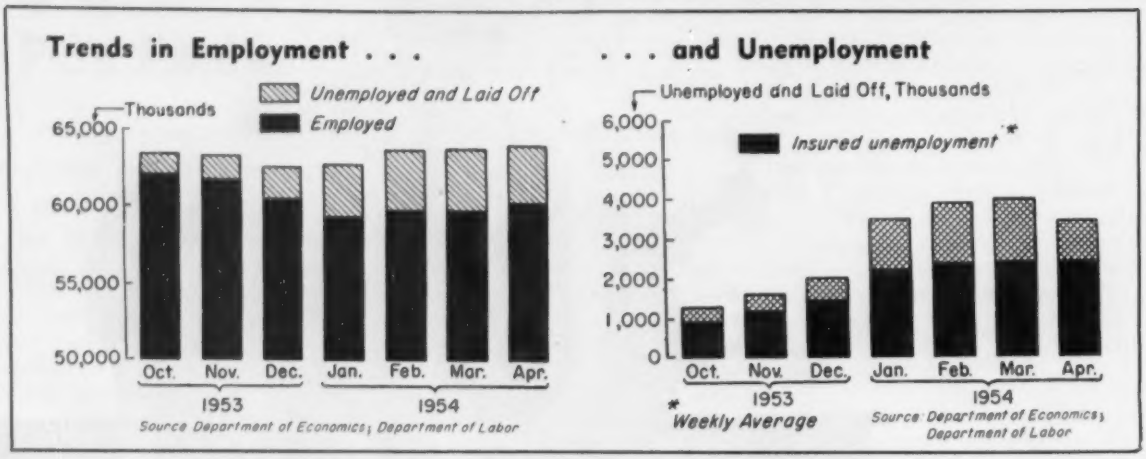
ELECTRICAL BUSINESS OUTLOOK



Political Ammunition: Unemployment

Statistics on employment and unemployment are more than just economic indicators. In this day and age, they are also political ammunition of the strongest sort. With politics clouding the picture, it's a good idea to have a clear idea of just what the employment figures mean before the politicos get their silver tongues on them.

Unemployment rose sharply in the late fall and early winter, as the result of the drop in general economic activity in the United States. Total unemployment just about tripled between October, 1953, and March, 1954, to a level of 3.7 million. That was the highest total for any month since 1950, and it was cited as proof that the United States was well into a serious depression.

Spring Fever . . . But in April, unemployment declined by more than 250,000. That change has been hailed as proof that the business recession has come to an end, and that recovery has started. Judging by figures available so far, May will show a further improvement in the unemployment situation.

Unfortunately for the more optimistic observers, the April drop in unemployment was not the great improvement it seemed. In fact—by comparison with the normal seasonal pattern of employment—it was no improvement at all. Unemployment normally declines in the spring, as production picks up in agriculture and in certain manufacturing industries, notably automobiles.

Unemployment Drops in May . . . The same is true for May. Unemployment generally drops by at least 200,000 in May, for seasonal reasons. If the drop is not at least that great this year, then there has been no "improvement" in the unemployment situation—no matter what the politicians say.

The month of June is another story—just the opposite, in fact. Unemployment normally increases by about 500,000 in June, largely because of the huge number of people who finish school and start looking for work in that month. The full statistics on June unemployment won't be available until early July, but they are sure to bring an outcry about economic disaster when they are published.

As for the rest of the summer, July should show little change in unemployment, and August should show a drop of some 300,000—provided that there is no basic change in the level of business. Use these figures as yardsticks for normal changes in unemployment: minus 200,000 in May, plus 500,000 in June, no change in July and minus 300,000 in August.

In judging the meaning of unemployment trends, two other points are important. One is the effect of normal increases in the labor force; the other is the offsetting effect of unemployment insurance payments.

In any period when the economy does not actually grow—just stays steady—unemployment is likely to increase. That's because the labor force is growing fairly rapidly, at about 700,000 a year. Discharges from the Armed Services helped make it grow faster than normal in the past year. Thus, changes in unemployment may exaggerate the size of a decline in business.

The undesirable **economic** effects of unemployment are exaggerated by the unemployment figures. The reason is that unemployment insurance now covers a major share of the people who lose their jobs in an economic decline like the recent one.

Insurance payments fall far short of equaling the loss of wages suffered by most unemployed people, and they certainly can't undo the damage that unemployment may do to their morale. But they certainly do help to minimize the economic effects of a decline in business, especially if the decline does not last too long.

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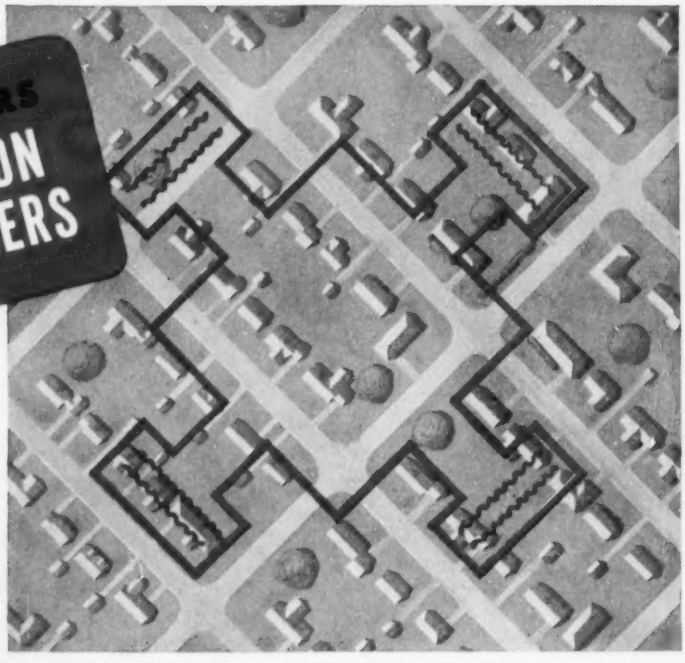

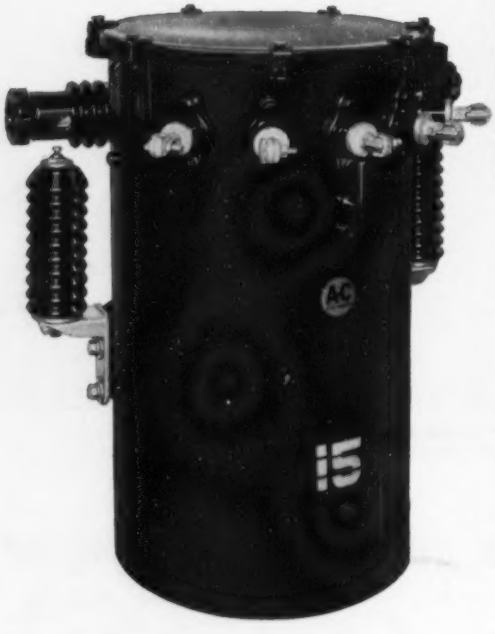

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